FREE! 6 HOURS OF VIDEO + PROJECT FILES + ZBRUSH MODELS

INSPIRING CG ARTISTS

3D WORLD

3dworld.creativebloq.com
March 2016
#205

+ SCULPT A NORMAN ROCKWELL CHARACTER USING **ZBRUSH**

12GB OF FREE ASSETS TO DOWNLOAD

Creative MARKET **FREE!** FULLY RIGGED MODEL

MASTER QUIXEL 2

Get started in this year's best texture app



PRO ADVICE TO MODEL ROBOTS

LEARN TO CREATE AMAZING

MECHS

How to take a war machine from concept to final render in **3ds Max**, **Mudbox** & **Corona Renderer**

Future

THE DIGITAL ANIMATION & VISUAL EFFECTS SCHOOL

DAVE SCHOOL

www.daveschool.com





MALUSI TUGWANA
2015 GRADUATE

"If I've learned anything from The Dave School, it would be the value of hard work, determination and the importance of having a strong passion for doing something you love. At the end of the day, coming to The DAVE School was one of the best decisions I've made in my life and I would implore any other aspiring 3D Artist to do the same."

ACADEMIC PARTNER

TO SPEAK WITH ADMISSIONS OR TO SCHEDULE A TOUR, PLEASE **CALL (855)328-3839**
THE DAVE SCHOOL IS LOCATED ON THE BACK LOT OF **UNIVERSAL STUDIOS FLORIDA®** IN ORLANDO.

THE DAVE SCHOOL IS NOT OPERATED BY NOR AFFILIATED WITH UNIVERSAL ORLANDO®

FREE! VIDEO AND ASSETS
Turn to page 6



EDITOR'S

WELCOME

Take your mech models to the next level

This issue we've gathered together a group of amazing artists to share their advice for designing, modelling and rendering robots and mechs on page 36. Also, beginning on page 30 our team of expert artists answer your mech-related CG art queries. Plus, turn to page 48 to discover how to create this issue's mech cover. Using 3ds Max, Mudbox and Corona Renderer, our cover artist Tomi Väisänen shares his pro workflow to model, texture and render a battle-damaged mech. If you like what you read this issue, why not take things a step further and subscribe to our new Pro Subs club offer; members get exclusive news, discounts and offers as well as 3D World delivered both in print and digitally! See page 53 for details.

SUBSCRIBE

Subscribe to 3D World and get both the print and digital editions. Turn to page 46 for the latest offers!





MASTER QUIXEL 2
Get started in the latest texture app with our pro training on page 54

Ian Dean, editor
ian.dean@futurenet.com

EMAIL
3dworld@futurenet.com

WEBSITE
3dworld.creativebloq.com

FACEBOOK
www.facebook.com/3dworldmagazine

TWITTER
@3DWorldMag



DIGITAL SUBSCRIPTIONS

Get the latest magazine for free in our current offer or download a back issue on iPad and iPhone today! www.bit.ly/3dworld-app

3D WORLD

ISSUE 205

CONTENTS

Our complete line-up for this month's 3D World

6 FREE DOWNLOADS
Get your hands on 12GB of assets via our Vault download system

8 ARTIST SHOWCASE
Discover the best new digital art and more from the CG world

17 COMMUNITY

18 REMOTE WORKING REVOLUTION
Are new ways of working handing power to smaller studios and artists?

20 FREE SPACE EXPLORER MODEL
Download from Creative Market

28 REFORMING RENDERING
How one company are changing rendering as we know it

30 ARTIST Q&A
All your software queries solved by our panel of professional artists

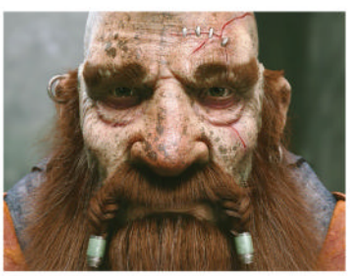
FEATURE

36 MODEL MARVELOUS MECHS
Expert artists share their techniques

47 TUTORIALS
Improve your CG art skills with our professional advice and training

85 DEVELOP
Theory, research and reviews

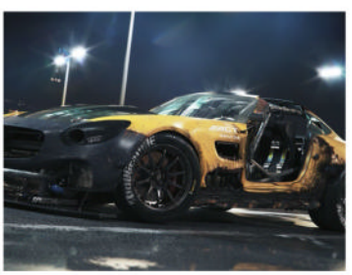
REGULARS
46 SUBSCRIPTIONS
53 PRO SUBSCRIPTIONS
75 NEXT MONTH
98 DIGITAL BACK ISSUES



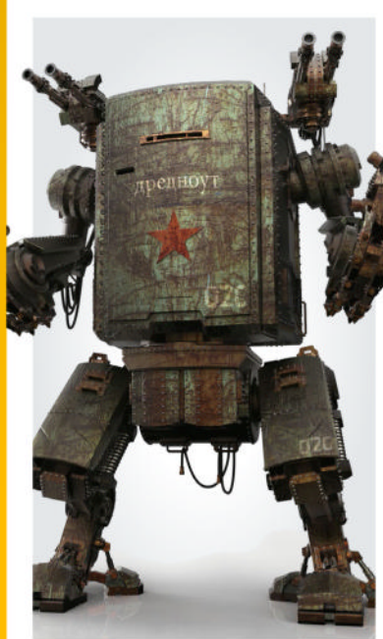
8 ARTIST SHOWCASE
The best new art from the CG community



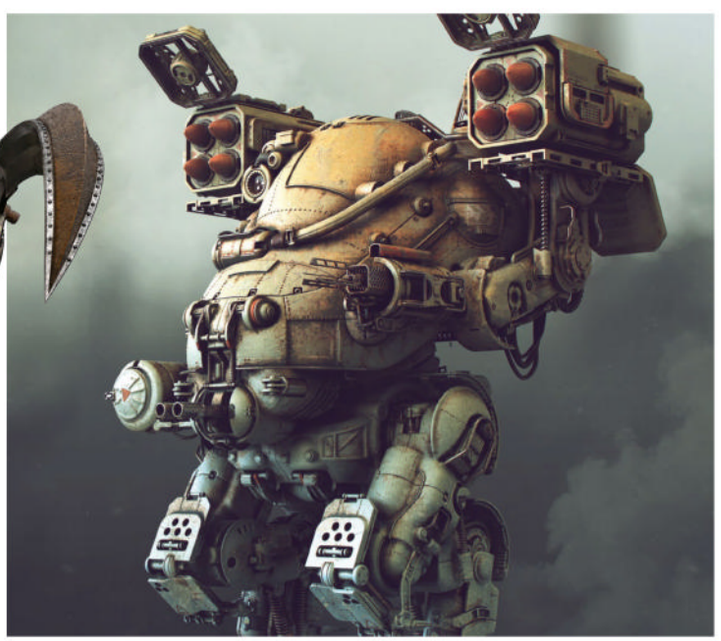
20 CREATIVE MARKET
Explore Polygonmaker's Space Explorer Lite



22 LIFE IN THE FAST LANE
Meet Humster3D's car render challenge winner



30 ARTIST Q&A
Your CG art problems solved



36 FEATURE: CREATING MECHANICAL MARVELS
Expert artists share their processes and techniques to model mechs and robots



48 MASTER MECH MODELLING
Tomi Väisänen shows you how to create a tank-inspired walking mech



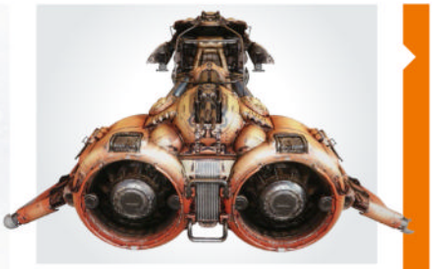
62 CREATE DETAILED FOLIAGE
Master detailed vegetation for arch-viz



70 IMPROVE YOUR SCULPTS
Add personality to your 3D illustration



86 GET STARTED IN V-RAY FOR NUKE
Josh Parks offers his advice for managing the plug-in's pitfalls and solutions



54 GET STARTED IN QUIXEL 2
Top tips to master the latest texture app



78 CREATE A DYNAMIC DRESS
Master the Marvelous Designer 5 process



94 REVIEW: POSER PRO 11
Cirstyn Bech-Yagher trials the latest release



97 REVIEW: REDSHIFT
Mike Griggs reviews the impressive renderer

TUTORIALS

48 IMPROVE YOUR MECH MODELLING SKILLS
Design, model and render a tank-inspired walking mech

54 GET STARTED WITH QUIXEL SUITE 2
Master the tips to improve your normal maps and texture detail

60 RENDER A STILL LIFE SCENE
Bhaumik Patel shows how to create and apply texture maps

62 CREATE DETAILED FOLIAGE
Use 3ds Max plug-ins to create detailed vegetation for arch-viz

70 MASTER PERSONALITY IN 3D ILLUSTRATIONS
Hannah Kang's tips for adding personality to your 3D art

76 CREATE TRUE-TO-NATURE TREES IN BLENDER
Master The Grove plug-in to grow realistic trees

78 DESIGN A DYNAMIC RENAISSANCE DRESS
Camille Kleinman shares her process using Marvelous Designer 5

FREE! MODELS, VIDEO AND FILES

DEVELOP

86 GET STARTED IN V-RAY FOR NUKE
Josh Parks talks through how to get the most from the plug-in

89 HOW IS TECHNOLOGY HELPING ROBOTS BECOME MORE HUMAN?
Dr Ian Palmer examines the shift in creating robots for film

90 BUILD A 3D VIRTUAL ENVIRONMENT
Marta Niemczynska reveals how to use Unity 5 to create a vitual CG studio

REVIEWS

94 POSER PRO 11
How does the latest version fare?

96 PAINT & STICK
The After Effects paint tool delivers

97 REDSHIFT
The renderer set to dominate

100 MY INSPIRATION
How a VHS demo led Image Engine's Dave Morley into VFX

12GB OF VIDEO & FILES

IN THE VAULT

FREE RESOURCES

Follow the link to download your free files

www.creativebloq.com/vault/3dw205

GET YOUR RESOURCES

You're three steps away from this issue's video training and files…

1. GO TO THE WEBSITE
Type this into your browser's address bar: www.creativebloq.com/vault/3dw205

2. FIND THE FILES YOU WANT
Search the list of free resources to find the video and files you want.

3. DOWNLOAD WHAT YOU NEED
Click the Download buttons and your files will save to your PC or Mac.

PLUS!

There are more files, art and resources waiting online…

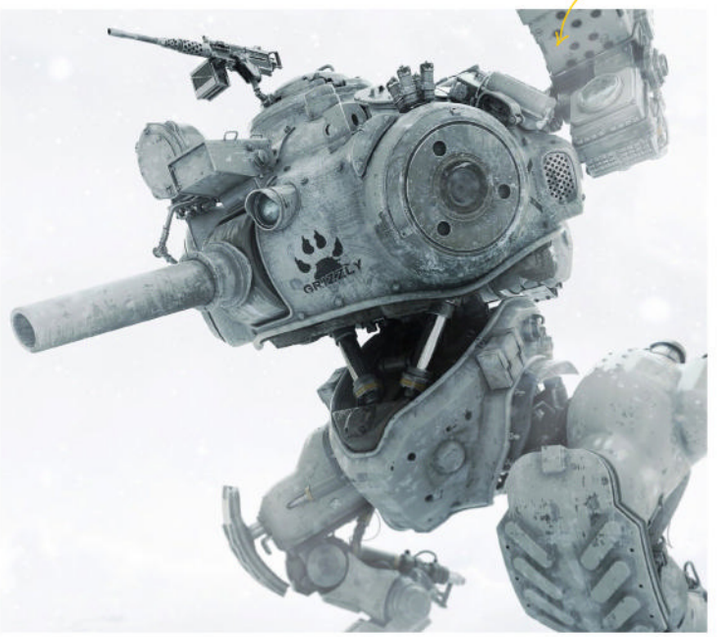
Video+files Download the files and video to texture a still life render

Files Download the training for this issue's Artist Q&A tutorials

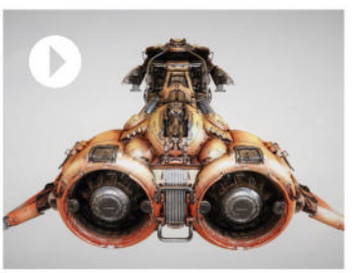
Artwork Download the extra tutorial images to accompany Showcase

Files Download the files to get more from the VR office project

Model & render this mech!



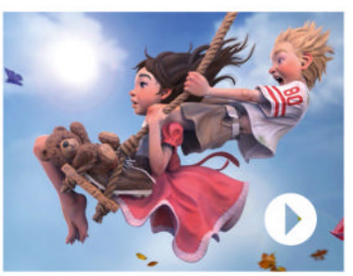
FILES MASTER 3DS MAX FOR MECH MODELLING
Download the high-res art to follow along to this issue's cover tutorial



VIDEO+MODEL QUIXEL 2
Download the video training and model



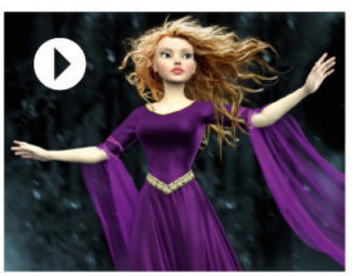
VIDEO+FILES VEGETATION
Create realistic foliage for arch-viz



VIDEO+FILES SCULPTING
Video to help improve your ZBrush sculpts



FREE MODEL SCI-FI FIGURE
Download this free Creative Market model



VIDEO+FILES CLOTH SIMS
Follow the video to create a dynamic dress

CONTACT US

3D WORLD MAGAZINE
FUTURE PUBLISHING
Quay House, The Ambury,
Bath, BA1 1UA

telephone: +44 (0) 1225 442244
email: enquiries@3dworldmag.com
website: 3dworld.creativebloq.com
facebook: www.facebook.com/3dworldmagazine
twitter: @3DWorldMag

EDITORIAL
EDITOR *Ian Dean*
ART EDITOR *Darren Phillips*
PRODUCTION EDITOR *Felicity Barr*
COMMISSIONING EDITOR *Julia Sagar*
DEPUTY COMMISSIONING EDITOR *Sammy Maine*
STAFF WRITERS *Alice Pattillo, Dominic Carter*

CONTRIBUTORS
Amin Akhshi, Carsten Biernat, Cirstyn Bech-Yagher, Alex Duce, Tor Frick, Mike Griggs, Ryan Groves, Nadeera Gunasekara, Trevor Hogg, Steven Jarratt, Hannah Kang, Wybren van Keulen, Camille Kleinman, Paul Massey, Marta Niemczynska, Wiktor Öhman, Valeriy Orlov, Josh Parks, Dr Ian Palmer, Bhaumik Patel, Rob Redman, André Roux, Alex Summersby, Furio Tedeschi, Matt Tkocz, Tomi Väisänen, Alvin Weetman, Jörn Zimmermann

MANAGEMENT
MANAGING DIRECTOR MAGAZINES DIVISION *Joe McEvoy*
EDITORIAL DIRECTOR *Matthew Pierce*
GROUP ART DIRECTOR *Rodney Dive*

ADVERTISING
ADVERTISING MANAGER *Sasha McGregor*
(0)1225 687675 sasha.mcgregor@futurenet.com
ACCOUNT DIRECTOR *George Lucas*
(0)1225 687311 george.lucas@futurenet.com
SALES EXECUTIVE *Chris Mitchell*
(0)1225 687832 chris.mitchell@futurenet.com

PRODUCTION & DISTRIBUTION
PRODUCTION CONTROLLER *Nola Cokely*
PRODUCTION MANAGER *Mark Constance*
PRINTED IN THE UK BY:
William Gibbons & Sons Ltd on behalf of Future.
DISTRIBUTED BY:
Seymour Distribution Ltd, 2 East Poultry Avenue, London EC1A 9PT, Tel: 0207 429 4000
OVERSEAS DISTRIBUTION BY:
Seymour International

CIRCULATION
TRADE MARKETING MANAGER *Juliette Winyard*
07551 150 984 juliette.winyard@futurenet.com

LICENSING
SENIOR LICENSING & SYNDICATION MANAGER
Matt Ellis Matt.Ellis@futurenet.com
+ 44 (0)1225 442244 Fax +44 (0)1225 732275

SUBSCRIPTIONS
UK READER ORDER LINE & ENQUIRIES:
0844 848 2852
OVERSEAS READER ORDER LINE & ENQUIRIES:
+44 (0)1604 251045
ONLINE ENQUIRIES: www.myfavouritemagazines.co.uk
EMAIL: 3dworld@myfavouritemagazines.co.uk

Want to work for Future?
Visit www.yourfuturejob.com

Future

Future is an award-winning international media group and leading digital business. We reach more than 49 million international consumers a month and create world-class content and advertising solutions for passionate consumers online, on tablet & smartphone and in print.

Future plc is a public company quoted on the London Stock Exchange (symbol: FUTR).
www.futureplc.com

Chief executive Zillah Byng-Thorne
Non-executive chairman Peter Allen
Chief financial officer Richard Haley

Tel +44 (0)207 042 4000 (London)
Tel +44 (0)1225 442 244 (Bath)

All contents copyright © 2015 Future Publishing Limited or published under licence. All rights reserved. No part of this magazine may be reproduced, stored, transmitted or used in any way without the prior written permission of the publisher. Future Publishing Limited (company number 2008885) is registered in England and Wales. Registered office: Registered office: Quay House, The Ambury, Bath, BA1 1UA. All information contained in this publication is for information only and is, as far as we are aware, correct at the time of going to press. Future cannot accept any responsibility for errors or inaccuracies in such information. You are advised to contact manufacturers and retailers directly with regard to the price and other details of products or services referred to in this publication. Apps and websites mentioned in this publication are not under our control. We are not responsible for their contents or any changes or updates to them. If you submit unsolicited material to us, you automatically grant Future a licence to publish your submission in whole or in part in all editions of the magazine, including licensed editions worldwide and in any physical or digital format throughout the world. Any material you submit is sent at your risk and, although every care is taken, neither Future nor its employees, agents or subcontractors shall be liable for loss or damage.

METTLE SKYBOX STUDIO



360/VR Production Tools for After Effects

- Generate 360/VR from your comp
- Import stitched 360 footage, or Equirectangular 3D animation, and add graphics, text and VFX.

"SkyBox Studio is a necessity for cinematic 360/VR production in After Effects. Especially if you're working with 360 degree footage."
Mikey Borup *After Effects WIth Mikey*

Try SkyBox Studio now
mettle.com/product/skybox-studio

METTLE

ARTIST

SHOWCASE

The best digital art from the CG community



As a generalist I always try to learn as much as possible from all areas of 3D

GET PUBLISHED

EMAIL YOUR CG ART TO
ian.dean@futurenet.com

Visit the online Vault to download extra process art for these projects:
www.creativebloq.com/vault/3dw205

SEA CREATURE



ARTIST Beat Reichenbach
SOFTWARE ZBrush, Mudbox, Mari, Maya, Headus, Photoshop, V-Ray, Nuke

Currently in the final year of his Digital Production for Entertainment programme at Los Angeles' Gnomon School of Visual Effects, Swiss artist Beat Reichenbach created his Sea Creature over 10 weeks. Making sure there was a basis for the image – which in this case came in the form of Carlos Huante's original creature concept art and a matte painting by Tuomas Korpi – helped Beat organise his project.

"Always have an idea of where you want to go with your piece," he recommends. "That way you know exactly what parts of the shot you will see and where you have to be at the end of the deadline."

Despite having invested a lot of time into the research and creation of the Sea Creature, at one point Beat found that its texture was too smooth and lacked crucial details to give it a sense of scale. "So I went back to the modelling stage and sculpted four different looking barnacles," he reveals. "Instead of placing them hand by hand I used the spPaint3d script to quickly populate the back with them." Beat advises other 3D artists to utilise scripts as well as learning how to code. "Imagine if I had to place all the barnacles by hand. I would have easily spent hours instead of a few minutes."

FYI *Browse through more of Beat's amazing work by visiting* ***www.artofbeat.com***



3D WORLD VIEW

"Beat's certainly achieved the great texture he was after with his barnacles. I like his use of the spPaint3d script. "

IAN DEAN
Editor

I ended up finding a way to create larger variations in colour and appearance

DWARF WARRIOR



ARTIST Alessandro Barbosa
SOFTWARE ZBrush, V-Ray, Mudbox, Cavit, Photoshop, After Effects

Brazil-based freelance artist, Alessandro Barbosa, made his Dwarf Warrior as a personal project. Taking three weeks to create, Ale worked hard to juggle this around commercial projects. Starting with a human base from ZBrush, he painted the textures from scratch by mixing various native Mudbox brushes. "With 3D work I think I know a little of everything, but I'm not an expert in anything yet," he says.

While making his Dwarf Warrior, Alessandro expanded his rendering and modelling skills to create the figure's hair and beard. "I'm pretty happy with the result and I ended up finding a way to create larger variations in colour and appearance," he explains. Ale goes on to add that "for some parts of the fabric I worked with Marvelous Designer, while some parts, like the leather jacket, were modelled in 3ds Max."

In the past year Alessandro has focused on characters, due in part to the power of modern 3D software. "It allows us to create images of great realism, but this also challenges artists."

FYI *See more of Alessandro's portfolio at www.artstation.com/artist/alebarbosa*



3D WORLD VIEW

"Alessandro has definitely mastered the art of hair creation. The hair and beard really give this warrior his character."

DARREN PHILLIPS
Art editor

ULTRA HD

Blackmagicdesign



DAVINCI RESOLVE 12

The world's best color corrector is now the world's best editor!

Only DaVinci Resolve 12 combines professional editing with advanced color correction so you can edit and grade from start to finish, all in one single software tool! With over 80 incredible new features including multicam editing, advanced trimming, high performance audio, and incredible media management, DaVinci Resolve 12 is the editing solution you've been waiting for.

Super Fast Editing

DaVinci Resolve 12 has a massive set of professional editing and trimming tools that work exactly as you expect. You get context sensitive editing, dynamic and asymmetric trimming, titling, transitions, animation and more! The familiar multi track timeline, customizable interface and keyboard shortcuts make it easy to switch to DaVinci Resolve 12.

Incredible Multicam

No matter how many cameras you have on your shoot, DaVinci Resolve 12 lets you edit programs shot on multiple cameras faster than ever before. Quickly sync angles using timecode, in/out points, or even automatically based on sound and then watch them all playback in realtime while you cut between angles on the fly!

Unlimited Audio Effects

Now you can create the perfect mix by adding VST and Audio Unit plugins to entire tracks or individual clips! Resolve's sample accurate playback and smooth tape style scrubbing let you precisely edit audio in the timeline, or you can record fader automation using the new mixer! You can even export directly to ProTools for finishing!

Hollywood's Best Color

DaVinci is the world's most trusted name in color and has been used to grade more Hollywood films, TV shows, and commercials than anything else. Now you can switch between professional editing and Resolve's legendary color tools with a single click. DaVinci Resolve 12 goes far beyond anything you'll find in any other editing systems!

www.blackmagicdesign.com/uk

DAVINCI RESOLVE 12

Free Download now, for Mac OS X and Windows.

View Demo

BABY CHEWBACCA



ARTIST Thales Simonato
SOFTWARE Maya, ZBrush, Yeti, Mari, Arnold, aiShaders, Nuke

As a freelance 3D artist, Toronto based Thales Simonato has spent four years working on commercials for companies including Kumite and Tribbo Post. Created between freelance commissions, Baby Chewbacca took Thales roughly three months to complete.

Based on an original concept by Salvador Ramirez, this stylised Wookie required Thales to experiment with new skills. "I enjoyed the challenging part the most, which was creating the fur," he explains. "I love the original concept and for a long time I wanted to create this image, so I waited until I got some experience in fur development." To make things more complicated, the fur obscured the base shape and made it difficult to model. "So, I made a base body, and while I was doing the fur I would go back to the modelling, re-model and use it as a morph target," Thales says. "I also used the rigging to help me to reach the shape."

Besides being inspired by other 3D artists, such as Pedro Conti and Ali Bitaraf, Thales finds creative potential in his everyday life. "I really love what I do," says Thales, not at all fazed by the difficulty of this project. "I'm always finding ways to improve myself as an artist."

FYI *To see more of Thales' work, visit www.thalessimonato.com*

I'm always finding ways to improve myself as an artist

3D WORLD VIEW

"We're all huge Star Wars fans at 3D World, so Baby Chewbacca proved very popular. The fur that Thales has created is superb – he's mastered that skill."

IAN DEAN
Editor


KeyShot®
Amazing renderings and animations. In realtime.
The flexibility to work with your ZBrush/Maya/3DS/ files. Luscious materials that are ready at the starting gate. More time to create beautiful images. Less time wasted. You can create high-quality visuals faster than ever before, and you can do it using KeyShot.
Model by Luigi Memola
behance.net/memolaluigi
Learn more at
keyshot.com



Sketching the idea and setting a rough composition was therapeutic

FLY FISHING

ARTIST
Simon Edwards
SOFTWARE **RealFlow, ZBrush, 3ds Max, Photoshop, V-Ray**

Freelance architectural visualiser Simon Edwards is inspired by films, especially dramatic scenes where he studies the composition of camera angles and lighting. This influence can clearly be seen in the dynamic Fly Fishing, which took Simon four weeks to complete.

To create a sense of movement, Simon had to get to grips with a range of textures. "The water dynamics were created by building two low-poly representations of the fish and surrounding weed, then animating their movement through a water object in RealFlow over a one-second time frame," he explains. "The 'whipped up' sand is an instanced spherical object following multiple helix paths as a particle array."

Simon relied on pre-planning and concept art. "Sketching the idea and setting a rough composition was therapeutic. This is always a good idea, especially when modelling detailed forms in ZBrush. You want to avoid repositioning things too much later on, or discover additional areas requiring extra modelling."

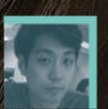
FYI *You can see some more examples of Simon's work at www.3dartvision.co.uk*

3D WORLD VIEW

"Fly Fishing is one of my favourites this issue. I imagine animating the movement was a lot of fun to do."

FELICITY BARR
Production editor

GIRL



ARTIST Soojong Kim
SOFTWARE ZBrush, 3ds Max, Marvelous Designer, Photoshop, V-Ray

Having started his VFX career working as a general 3D modeller, South Korean artist Soojong Kim moved into the video games industry six months ago and now creates 3D characters. Girl is based on the 2D illustrations of Irakli Nadar and took five weeks to create. "I spent a week and a half on the modelling and texturing, two weeks styling the hair using Hair and Fur, and two weeks on lighting and tweaking the final image," he explains.

Despite Soojong's 3D experience, the Girl project still taught him new tricks and posed problems to solve – but these obstacles and new approaches are part of the fun. "Typically, I work with game engines or Marmoset Toolbag, but here I wanted to create an image with V-Ray."

After creating the headsculpt in Mudbox, Soojong blew up the base mesh to a life-size scale and started a rough sculpt of the hair to measure volume and proportions. "To be honest I didn't plan it well before I started work so it took longer than usual. There was a lot of back and forth, minor changes and tweaking." Soojong recommends running images past fellow artists. "They could point out what I had been missing at a glance."

FYI *Find more of Soojong's character work by visiting* ***www.artstation.com/artist/salmon***



3D WORLD VIEW

"Soojong has created a stunning render and it's good to see he's experimented with different software."

DARREN PHILLIPS
Art editor

There was a lot of back and forth, minor changes and tweaking

WS-X ENHANCED WORKSTATION

BUILT FROM THE GROUND UP FOR OPTIMISED PERFORMANCE AND ROCK SOLID RELIABILITY



INTEL INSIDE ®

EXTRAORDINARY PERFORMANCE OUTSIDE

Workstation Specialists

CONTACT A REPRESENTATIVE

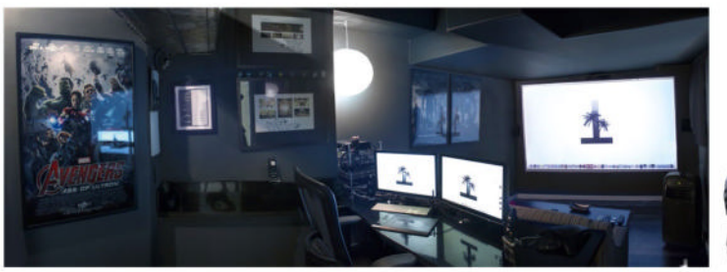
WWW.WORKSTATIONSPECIALISTS.COM
+44 (0) 800 180 4801
SALES@WKSMAIL.COM

© 2015 Workstation Specialists – Acecad Software Ltd. E & OE. © 2015 Intel Corporation. Intel and Intel Core are trademarks of the Intel Corporation in the U.S. and/or other countries. Logo & company/ product names are trademarks of their respective owners

CONTENTS

COMMUNITY

News and views from around the international CG community

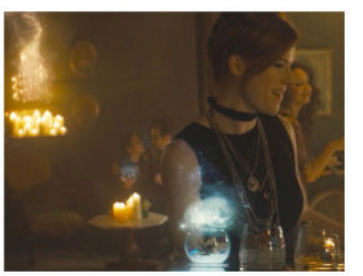




18 JOIN THE REMOTE WORKING REVOLUTION
How new ways of working are handing the power back to artists and small studios

20 SPACE EXPLORER
The best of Creative Market revealed





22 LIFE IN THE FAST LANE
How Humster3D's Car Render Challenge winner created his immaculate render

24 WITCH MAGIC
The VFX behind The Last Witch Hunter





26 MAKING THE REVENANT
The challenges of creating seamless reality

28 THE NEW RENDER REVOLUTION
How YellowDog is using crowdsourced processing power to transform rendering

GET PUBLISHED

EMAIL YOUR CG ART TO
ian.dean@futurenet.com

Visit the online Vault to download extra process art for these projects:
www.creativebloq.com/vault/3dw205



THE BIG ISSUE

JOIN THE REMOTE WORKING REVOLUTION

Tom May investigates how new ways of working are handing the power in the VFX industry back to artists and small studios

For most of the history of the VFX industry, one thing's seemed inescapable: the need for a massive, unyielding infrastructure, with all the costs and inflexibility that this can entail. Recently, though, smaller studios have been finding ways to buck the trend and operate outside of the normal setups. Take VFX Legion, a division of Legion Studios, LLC. It's a post-production facility in which, strictly speaking, there is no actual facility.

While Legion has a headquarters in Burbank, California, its 50 artists are distributed across the globe, contributing to each new project from wherever they see fit. Why?



"There's a really strong desire to want to work on VFX but not have to live in the most expensive cities in the world," says founder and creative director James Hattin. "We have fibre connections to our technology partners and serve out hundreds of gigs of data a day to artists all over the world. We climbed this hill simply because we could, and it seemed like the right thing to do."

"In general, this model works far and above expectations," he adds. "We can deliver hundreds of shots per week, which is something most people doing remote work find impressive. The challenge is thoroughness of information to the artists. We use Google Hangouts, Aspera and a robust Shotgun-based pipeline; we also make use of the remote review and approval tool cineSync. But there is still more information that doesn't always filter through. Once we solve that bottleneck I think we will be well on our way to having a hugely expandable model."

Overall, though, the pros far outweigh the cons. "This way, artists can have a life," he enthuses. "We have artists that are farmers in New Zealand, artists that live in the middle of America, in places one would never expect of someone who works on A-list movies and TV shows."

UK-based studio Rawpost follows a similar model, and tells a similarly



upbeat story. "All of our staff and freelancers work remotely at the moment," explains company director Jeremy Emmerson. "In practice it really comes down to the client and their budget vs workflow requirements; we then creatively 'manage' the team no matter where they may lurk. Many clients find it hard not being in a traditional edit suite initially," he adds, "but soon get the hang of it when they see the benefits."

"It's about confidence," he continues. "Confidence that your client has that



Capital T creates VFX for blockbuster movies from the calm of Maui

you are just as 'present' in remote as you would be in studio. Master that and you can edit on the moon whilst your client is fishing in Alaska."

Or if not the moon then how about the beautiful Hawaiian island of Maui? That's where Capital T carries out VFX work on big budget movies such as Ant-Man, Avengers: Age of Ultron and Insurgent, as co-founders Lindsay and Jamie Hallett explain. "After nearly two decades in the business,"



> We are fortunate enough to have earned people's faith in us, so we brought them here with us, in spirit and VFX

Lindsay Hallett, co-founder, Capital T

says Lindsay, "we knew we still loved what we did. But we were hoping to take it down a few notches so we could balance work with time with family, and we both love the islands. We spoke to all our clients prior to departing the mainland to see what they thought. We are fortunate enough to have earned people's faith in us, so we brought them here with us, in spirit and VFX."



"We haven't had any issues to date (knock wood!)," adds Jamie. "The time zone here works in our favour. We start our day when the sun comes up and wrap it up in the late afternoon (closing time on the mainland). Still enough time to hit the paddleboard!"

But what's it like as the remote worker? Craig Crane, Lidar supervisor for Marvel, gives us a view from the other end of the wire: "I tended to work remotely whilst Lidar scanning when at Double Negative, starting with John Carter," he explains. "The reasons ranged from either being overseas on location or working through the night on set, scanning on wrap. I'd work from anywhere I could set up a laptop – hotel rooms, craft services, airport lounges. And of course, on set."



Craig sounds a word of warning about remote working, however, suggesting it's not always perfect. "Time management is a skill you need to learn. It's all too easy to do a 20-hour day when you don't have a commute either end of it. Knowing when to switch off is a real skill, and one that I learnt through many years of not switching off."

FYI *Find out how the Cloud is changing the industry at www.bit.ly/vfx-cloud*

INDUSTRY INSIDERS

Thoughts & opinions from the experts



CRAIG CRANE
Director, Motion Associates Ltd
www.linkedin.com/in/craigcrane

"The biggest issue with remote working is the security of the data, so backups and encrypted drives are essential. My company Motion Associates is a provider of on-set Lidar scanning for VFX and takes clients' security requirements very seriously, to the point that we invested £40K last year alone in security measures to ensure we are compliant. These measures are applicable to working on-set, in our studio in Sussex and beyond."



JAMES HATTIN
Founder, VFX Legion
vfxlegion.com

"I first came up with the idea of a fully remote pipeline in 2000. ISDN was the fastest internet we could afford. Living 400 miles from my office in Santa Monica, I'd make a duplicate drive of all the data needed to composite the work, then transfer project files back and forth between home and work. Rendering would happen in both places. I'd remote access the office computer with the director sat at the machine and play back the movies to get approvals or notes. It was a poor man's process since replaced by tools like Google Hangouts and Cospective CineSync."



JEREMY EMMERSON
Director, Rawpost
rawpost.co.uk

"We use industry standard timeline sync software that allows multiple computers to hook up concurrently. When my client in New York slides the timeline to the frame showing the car as it crashes through a window, my picture in London jumps to the exact same frame. When I draw a squiggle on that frame, she sees it at exactly the same time. Playback runs perfectly in sync across all computers that have logged on. Very neat. We even use it within the same building as it allows for frame-accurate reviews of a piece of work with our own operators."



VFX Legion used remote viewing tool CineSync for Jem and the Holograms

CREATIVE MARKET

REACH FOR THE STARS

We're partnering with Creative Market to offer a series of free downloads, continuing with Polygonmaker's Space Explorer Lite

When you're creating amazing new 3D worlds, you need someone to explore them. Who better than this awesome space explorer, an animated character with optimised polygon count? It's the work of 'Polygonmaker', aka Brazilian 3D artist Fabio Brasiliense, who specialises in creating 3D art for mobile games. His work can be seen on Creative Market.

A platform for digital design content from independent creatives around the world, Creative Market recently launched a 3D art section. It's a great place to sell your content, says Fabio. "I've been creating characters for online stores since 2011, and uploaded the models to Creative Market just before the 3D store opened," he explains. "It looked like a great opportunity to expand the business."



FABIO BRASILIENSE
Fabio, aka Polygonmaker, is a supplier of royalty free art packages for game developers. www.creativemarket.com/polygonmaker

Fabio has two main workflows when creating his models. The first is a low poly workflow. "Sometimes I sculpt a very basic model in ZBrush to get the overall proportions and then finalise in 3ds Max; others I just model directly in 3ds Max," he explains.

"Then I create the UV's rig and animations in 3ds Max. For texturing I use mainly Photoshop. I also use an old version of BodyPaint only to fix the seams and paint some trick details."

> Working with new tech is a great experience. I've always liked challenges, and sometimes we make things that haven't been done before

Fabio's second option is a PBR workflow, using ZBrush for the high poly (3ds Max for some non-organic shapes) and to create the basic low poly. "I'll finish the low poly and create UVs in 3ds Max," he explains. "And I'll bake the maps from the high poly using xNormal. I use handplane to get the Basic Normal map; Photoshop to clean the maps; and Quixel to create the base materials for PBR. I'll finish the textures in Photoshop and use BodyPaint to fix the seams."

Enjoying the challenge

Fabio has been working in the industry since 2008, when he took an animation course at QANTM School in Brisbane, Australia. He's spent the last 18 months working as a character artist for Oculus VR. "Working with this new tech is a great experience," he enthuses. "I've always liked challenges, and sometimes we're making things that haven't been done before."

Once again we've partnered with CreativeMarket.com to make Polygonmaker's Space Explorer Lite available for readers to download – absolutely free for personal use! To get the free model visit our online Vault at www.creativebloq.com/vault/3dw205 and download. This pack is free for personal use only: to purchase for commercial use, visit bit.ly/205-shop.

FYI *For more of Fabio's work go to creativemarket.com/polygonmaker*



Fabio specialises in the creation of 3D art for mobile games, like this amazing space explorer

HORDES OF HEROES

There's more where that came from...

HEROES – DARK KNIGHT
This high quality animated knight comes with two LOD levels (3344 tris and 1554 tris) and two high quality sets of textures. The package includes 12 animations. Get it at: **bit.ly/205-knight**



FANTASY HORDE – TROLLS
These animated characters come with an optimised polygon count, two LOD levels (6000tris and 3000tris) and four different textures. The pack includes 12 animations and face rig. Download here: **bit.ly/205-trolls**



LOW POLY GOBLINS
These three low poly goblins are optimised for mobile. The pack comes with 950-1050 tris for the complete character and weapons, three textures on each and eight animations. Download it at: **bit.ly/205-goblins**




IMAGE COURTESY OF PAOLO GIANDOSO
ZBRUSH 4R7®
Pixologic
PIXOLOGIC.COM
THE ALL-IN-ONE DIGITAL SCULPTING SOLUTION.
DESIGNED FOR THE PURSUIT OF ART.



This stunning scene won Carlos Pecino first place in the Humster3D Car Render Challenge

INDUSTRY PROJECT

LIFE IN THE FAST LANE

Carlos Pecino explains how he created this contest winning scene of Mercedes' flagship sports car



The winning entry in the Car Render Challenge set by Humster3D, this Mercedes AMG GT 2080 takes our breath away. The composition is full of energy and character, with a stunning degree of photorealism. A huge amount of modelling work has clearly gone into it.

> I believe these 3D programs bring us the necessary tools to recreate anything we imagine. The only limits are in our minds



CARLOS PECINO
Carlos Pecino, aka ColorSponge, is a 3D artist with more than 12 years' experience in the digital world. Clients include Vodafone, Repsol, Bankia, BMW, Audi, Acciona, Ono, Orange and Burger King. www.colorsponge.net

"The inspiration comes from many sources," explains Carlos Pecino, who created it using 3ds Max, V-Ray and Photoshop. "They include the www.speedhunters.com website – a must for every motoring enthusiast; the artist Khyzyl Saleem (his 2D portfolio is amazing); and of course I always try to work with photographic references."

Finding references was, however, initially tricky and Carlos had to scour motoring forums to find suitable references for the different parts of the car. He then set about the task of modelling, starting with basic shapes, creating the chassis structure and seat, then developing other parts of the vehicle including the wheels, bumper, spoilers and cooling system.

"I decided that I would dive deep into the 3D modelling of the details," he explains. "At this stage, I didn't have a precise vision of what the final scene would look like, so I just wanted it all to be in the model for later. At that time I was thinking about one or two main views and also about close-up views. Having a detailed 3D model gives an opportunity to make flexible decisions about those things later on."

Carlos put a lot of time and effort into developing appropriate lighting for his scene. "I didn't want just to set a VRayLight and have it done," he explains. "The lights tell us a story, providing the hue and enhancing the shaders, so I really needed to get the atmosphere right." Colour was another headache, he adds. "Once I had the post-production done, I spent days changing tones, saturation and levels, transferring the final image through different screens."

However, the biggest technical challenge Carlos faced was optimising both the modelling and texturing. "It was a matter of being focused on every single process and not wasting my 24GB RAM," he explains. "Too many unnecessary polygons and oversize textures would have killed my PC!"

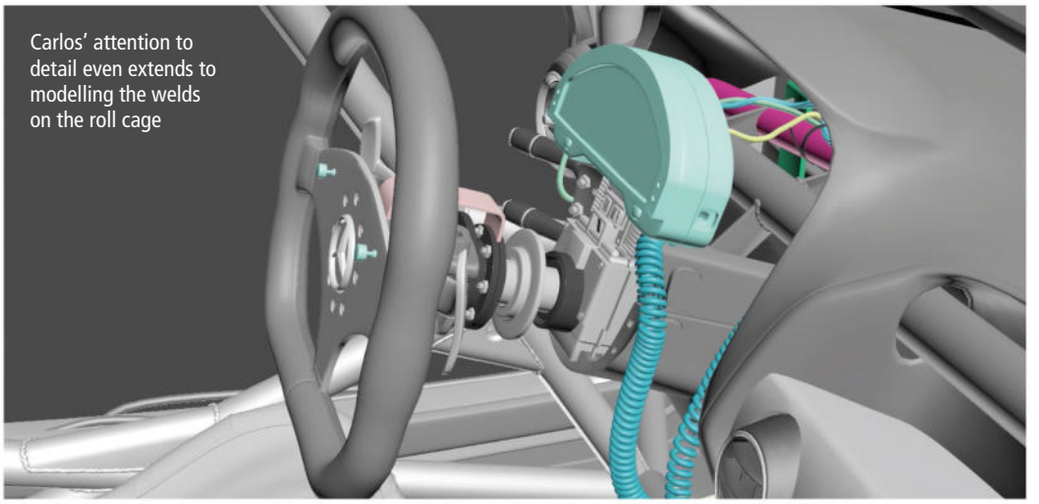
Ending the year in style

It was all worth it in the end though, with victory in the competition capping off a great year for the artist, who's been working in 3D for 12 years across architecture, graphic design, illustration and advertising.

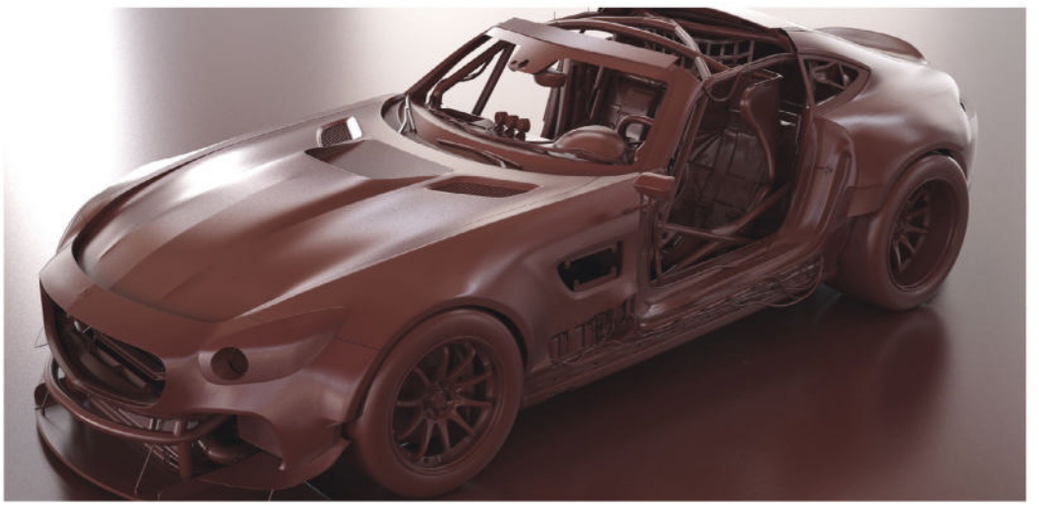
It all began when he was 15 years old, he explains. "A good friend brought me 3D Studio MAX R3, and I started as an autodidact, using it to recreate very simple scenes like interiors, buildings, and especially cars. I realised that there was a world to satisfy my artistic and professional inquietude. I believe these 3D programs bring us the necessary tools to recreate anything we imagine. The only limits are in our minds."

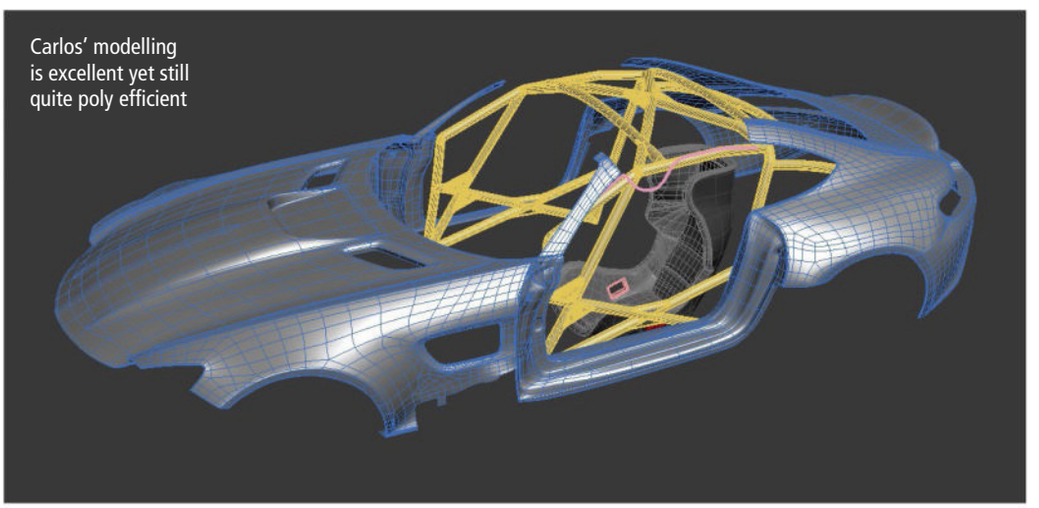
FYI *For more details on the Humster3D car challenge, visit bit.ly/humster-win*





Carlos' attention to detail even extends to modelling the welds on the roll cage





Carlos' modelling is excellent yet still quite poly efficient

RUNNERS-UP

The second and third-place winners share their insights

SICK BASTARDS

Second place in the Humster3D competition was 'Sick Bastards' by the RStyle team, who used 3ds Max, Corona, ZBrush and Photoshop. "Producing this image gave us a good workout with UVW texture unwrapping," explains founder Konstantin Rozumny. "The hardest part to model was the car's engine – I had to dive into mechanical drawings and photos to make it." Working from one camera view enabled him to add a huge amount of details to the foreground objects. "This gives an impression that all the geometry in the image is very detailed. I also spent a lot of time on textures, most of which are custom handmade. Bump maps, reflection maps and dirt maps add a great amount of detail to the image, even if the geometry is not very complex."



THE LAST BATCH

Third place went to The Last Batch by Piotr Tatar, which was inspired by Breaking Bad. "There aren't so many pictures of this vehicle on the web, so I used stills from the show as reference if I didn't know how to model or texture some particular part," explains Piotr, who used 3ds Max, V-Ray, Nuke, FumeFX, Marvelous Designer, Photoshop, Mari and SpeedTree. He established his camera at an early stage with a simple box and cylinders to represent the car. "I tried not to make big changes until the end," he says, "which helped me to focus only on the visible elements and add as much interesting detail as I could. I rendered this picture at 5K resolution and every test was also made at this final resolution with region rendering."





Image Engine used a mix of techniques in Nuke and Houdini to create 150 shots for The Last Witch Hunter

INDUSTRY INTERVIEW

IMAGINE THE MAGIC OF VFX

Image Engine reveals the magic behind The Last Witch Hunter

Coming on to a movie late in production can throw up its own challenges, as Image Engine discovered when they were drafted in to add a little magic to Vin Diesel's fantasy movie The Last Witch Hunter. Many of the sequences awarded to Image Engine were not initially intended to have CG touches.



MAT KRENTZ
Mat has worked in film for over 15 years, with credits including Transformers 3, Game of Thrones Season 5 and The Da Vinci Code (for which he received a VES nomination). Mat is also a Leo Award Winner. www.bit.ly/mat-krentz

"Coming in late on the project we were asked to make things look a little bit more mystical and exciting, such as adding burning runes and magical auras floating about and above candles," explains visual effects supervisor Mat Krentz. "While we only worked on around 150 VFX shots on the show, they all contained very different types of work, from CG set extensions to 2D compositing work."

A particular sequence was the 'Witch Council Chamber', which was shot on set but the director, Breck Eisner, felt it looked too enclosed. Image Engine's concept artist Rob Jensen worked with the client's designs to provide a look that transformed the set from a simple brick rotunda into a wider cathedral with recessed statues. "We built a full CG set to make it larger and grander. This was challenging as it was after the fact and no green screen was used on the set," says Mat.



SHANE DAVIDSON
With over 16 years in the industry, Shane has worked on some exciting films, including Chappie. bit.ly/shane_davidson

"As a practical set, it was not set up from a compositing standpoint – the set extension was an afterthought," adds Shane Davidson, Image Engine compositing supervisor. "As it contained complex root structures, various props and actors with elaborate hairstyles, the rotoscoping was particularly challenging."

Each sequence as well as many individual shots represented unique challenges, meaning that assets were rarely reused. "There were lots of shots with one-off design bits; this project had more of a generalist feel," says Mat. "We had to design new looks over and over again, rather than rely on one asset added into multiple shots."

Make the magic

The subject itself offered a unique challenge. Magic is very subjective when presented in films: "There's always a learning curve to establish what they want, as it means different things to different people," shares Shane.

CG magic needs to be photoreal but feel unreal, so the FX team ensured the CG magical effects were grounded and driven by the lighting in the plates. "For example, in the bar scene, they wanted to make a witch bar feel full of magic," says Shane. "To that end the effects were based on candles that existed in the practical plates."

FYI *To see more of Image Engine's VFX go to www.bit.ly/witch-hunter*

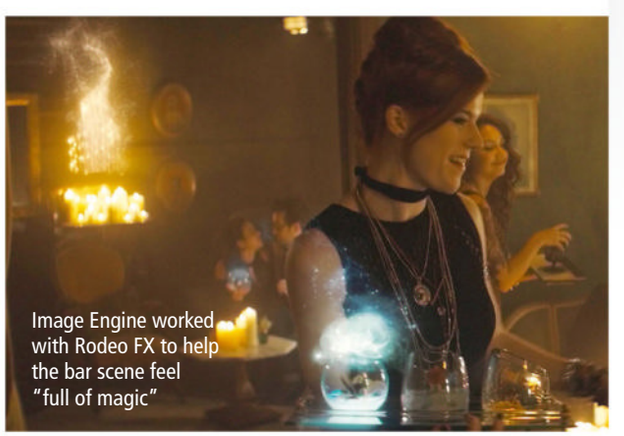


Image Engine worked with Rodeo FX to help the bar scene feel "full of magic"

SHANE & MAT'S PRO TIPS

Improve your process...

1. TRY IT YOURSELF
"Learn to look at things critically. Investigate how a shot or scene was put together, look at the development of the shot and try to emulate it, if possible."

2. KNOW THE TOOLS
"In comp you need to know your toolset. You should be ready to go, and artists who can be ready to jump on shots without thinking what tools do what are essential. Train yourself to look at colours and so forth in a shot and know which tool was used."

3. WHEN TO PASS
"Take time to look at how shots are created and understand what can and can't be done, and when to hand off to another department. Using the bar scene as an example, we used Houdini for the FX elements as we couldn't easily do them in Nuke, which was better tackled using dedicated effects software."

4. STUDY & LEARN
"Learn to watch a movie and understand how it has been built, who did what and how the different departments work together to take advantages of their strengths, and then be able to articulate that back – this is an important skill to master."


LOSE YOURSELF IN A WORLD OF
Vinyl
FIND YOURSELF IN
OXFAM'S ONLINE SHOP
oxfam.org.uk/shop
COLUMBIA
TIME ON MY HANDS
OXFAM



VFX INTERVIEW

CREATING A SEAMLESS REALITY

MPC's ***Arundi Asregadoo*** tells ***Trevor Hogg*** the challenges of creating natural realism in CG for The Revenant

Just as abandoned 19th century fur trapper Hugh Glass had to withstand a harsh wintery environment after being mauled by a grizzly bear, the production of The Revenant, which recounts his epic tale of survival and revenge, encountered unforgiving and fickle weather conditions that played havoc with the desire of the filmmaker Alejandro G. Iñárritu to shoot outdoors using only natural light. As much as cinematographer Emmanuel 'Chivo' Lubekzi was able to capture the imagery in-camera, some digital assistance was required with MPC being one of the key visual effects vendors.



ARUNDI ASREGADOO

Arundi has over 15 years' experience in VFX work at MPC, with films including Exodus, Skyfall and Dark Shadows on his CV. www.bit.ly/205-Arundi

"Richard was looking for realism and a natural look to the CG animation and effects we were tasked with creating," states MPC VFX supervisor Arundi Asregadoo when discussing his conversations with Richard McBride, who oversaw the visual effects work. "He and his team gave us references to help us create the look. In a meeting, Alejandro said, 'I would like you to create the effects with one hand behind your back. I don't want it to look like fantasy.'"

A continuous shot occurs when the hunting party is besieged by hostile Arikara Indians which results in them fleeing to their boats. "MPC was awarded the open sequence to the film, which comprised of 40 shots. Each shot was created by stitching together a number of scans/plates. Once the new plate was created CG and 2D elements were composited into it to create the final image. This process was recreated for each shot."

Natural realism

Influencing the creative process was the snowy conditions illuminated by natural light. "The photography was stunning," notes Arundi. "In order to create the feeling of one continuous shot, all images had to be shot at the same time. Chivo achieved this by filming



Subtle CG, including a horse, was used to retain the natural feel of the film

everything within the 'magic hour' so that the angle of the light and colour temperature of the image was as close as possible to each other. This gave us a great base to work from. To create the seamless blend from one shot to the next we had to replace the sky and add 2D elements to help create the illusion."

An array of computer software was needed in order to complete the assignment. "We use Autodesk Maya as a basis for many of our disciplines along with our own in-house proprietary software plug-ins; Nuke for compositing and Katana for lighting."

The challenge

"One of the difficulties was dealing with the parallax within the image," reveals Arundi. "The scene takes place along a river but we also travel amongst trees, which made it very difficult when you try to stitch one plate to the next. Another challenge we had was in blending the scans. In some cases they were shot in different formats, in others one plate would be shot using a track and the plate that we had to blend into would be shot on a Steadicam. The solutions were a combination of digital matte painting projected to parts of the shot that needed to be retimed. A lot of it was down to compositing tricks."

The efforts of Richard McBride, MPC, ILM, Cinesite and Gradient FX have not been overlooked as The Revenant is one of the favourites to win the Oscar for Best Visual Effects. "The viewer will not notice how much work went into the sequence," says Arundi who produced over 100 scans to invisibly blend the 40 shots into a continuous one. "A horse is shot in one of the most disturbing moments of the movie. Hopefully, they'll wonder if the poor horse was an amazing actor but obviously we created a full CG photo-real horse for the scene!"

> Alejandro said, 'I would like you to create the effects with one hand behind your back. I don't want it to look like fantasy'

FYI *To see more on MPC's work on The Revenant, visit bit.ly/205-revenant*

AWARDS SEASON

The VFX triumpths of 2015 that are battling it out for glory

OSCAR SHORTLIST RELEASED

At the time of going to print the shortlist for the best VFX Oscar for 2016 was announced and included 10 films that stood out in 2015, of that list MPC had worked on many, including The Revenant. As you read, this the list will have been baked off to the final five movies, but we're predicting a tussle between The Martian and Star Wars: The Force Awakens.

The 10 shortlisted movies are, Ant-Man, Avengers: Age of Ultron, Ex Machina, Jurassic World, Mad Max: Fury Road, The Martian, The Revenant, Star Wars: The Force Awakens, Tomorrowland and The Walk.

Adam Valdez, MPC animation director and VFX supervisor says, "2015 has been a significant year across all the MPC sites. Artists have continued to bring their collaborative spirit, creativity, determination and technical prowess to a wide range of work, and our studio continues to grow in all ways."

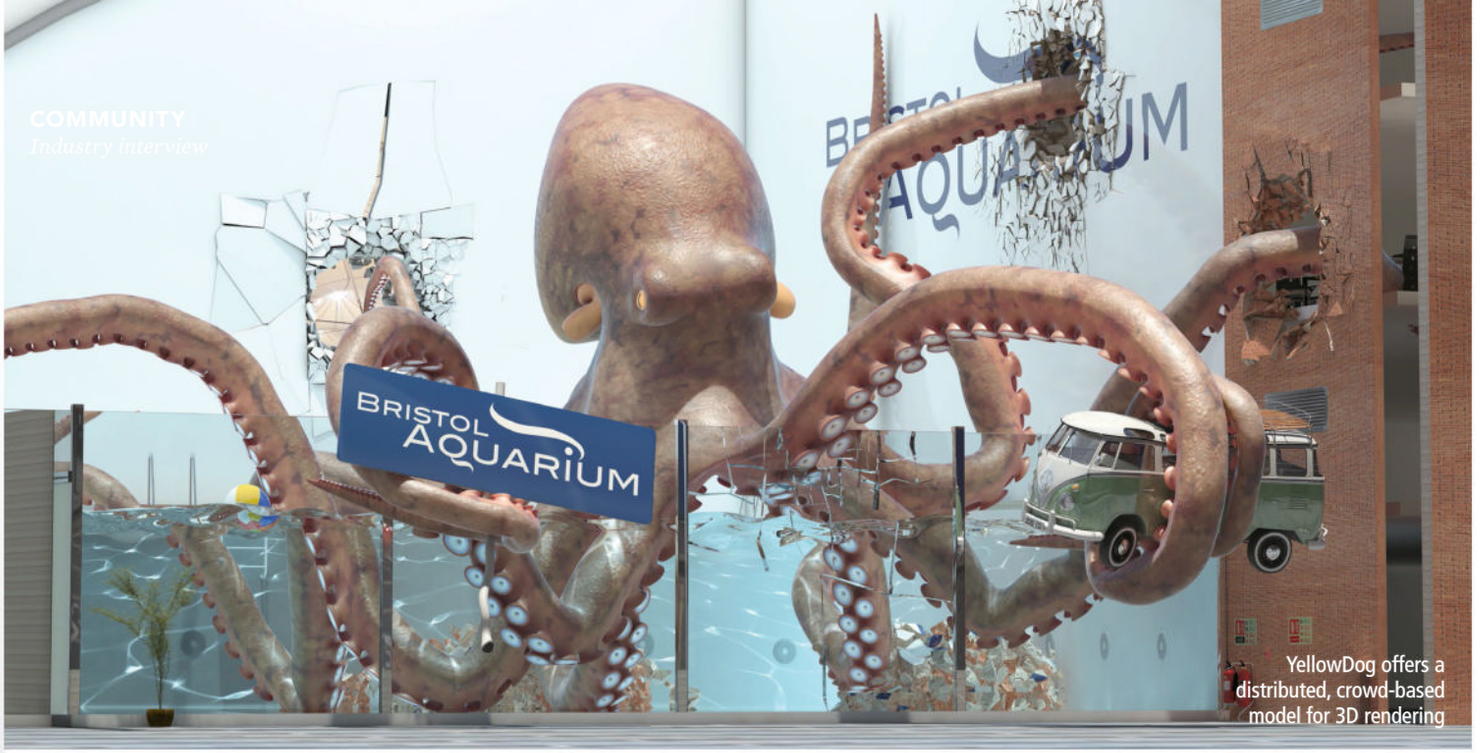
"Currently in production are some of our most challenging projects to date, not least of which is Disney's The Jungle Book, which has occupied the last two years of my time," says Adam, who points to 2016 as a year that could eclipse 2015 for VFX work. "Every group within the studio has brought their best for some amazing results. Other movies in the works for 2016 include Batman v Superman, Independence Day: Resurgence, Ghostbusters, X-Men: Apocalypse, Suicide Squad and Fantastic Beasts. The people of MPC continue to amaze me, and the work becomes more intricate and real and beautiful as the state of this art evolves. 2016 should be even bigger for us."

A mention and best wishes must go to all the vendors involved, including Industrial Light & Magic, Double Negative, Rodeo FX, Milk VFX and Iloura.

The 88th Academy Awards winners will be announced live on February 28th, 2016, so don't forget to visit www.creativebloq.com for the news of who's scooped the award. www.oscar.go.com



The Martian is one of 10 movies on the shortlist



YellowDog offers a distributed, crowd-based model for 3D rendering

INDUSTRY INTERVIEW

THE NEW RENDER REVOLUTION

By using crowdsourced processing power, YellowDog aims to change rendering as we know it and eliminate the need for investment in costly render farms

When it comes to the next big technical leaps forward for 3D studios, rendering is one of the hot areas for development. The UK's Bristol-based YellowDog is one company that's taking an innovative approach, which could prove to be a game-changer for small studios.

> YellowDog allows you to scale your operation as needed. I respect that they've sought out artists and listened to us from the beginning
>
> *Justin Dowling, CGI Artist, JD3D Ltd*

In simple terms, YellowDog releases the spare processing power from people's computers, and pays them for the privilege. This processing power is then offered to studios, giving them their own 'personal supercomputer'



Virtual Planit used YellowDog to render complex architectural visualisations



GARETH WILLIAMS
Gareth is managing director of YellowDog and has a background working in software and telecoms.
www.yellowdog.co

to improve how they render their creations. While outsourcing rendering to external companies is nothing new, managing director Gareth Williams argues that with conventional render farms, the time the job takes and its costs are often unpredictable, and the process often overcomplicated.

"It's not unusual for there to be errors in the final rendered animation from render farms," he adds. In contrast, YellowDog promises predictability of cost and time taken. "Studios only get charged what is quoted and the time taken to process is precisely calculated up front," says Gareth. "Also, compared to many technically complex render farms, YellowDog is very easy to use and interact with."

It's still early days for the company, but the pilot customers seem happy with the way things are going so far. Take Rich Line, partner at architectural visualisation studio Virtual Planit. "We were producing a CG animation for Liverpool Football Club and needed some extra fire power," he explains. "We heard YellowDog were looking for beta testers, so we've spent the last six months working with them to develop their service."



RICH LINE
Richard is partner at Virtual Planit, a team of visualisers, graphic designers, gamers and even a landscape architect.
www.virtual-planit.com

"When we first started, we could only render with Brute Force," he continues. "But now they've begun to incorporate light cache and irradiance maps as well as accommodating the plug-ins we use, such as MultiScatter and Forest Pack. The service has stacks of potential and in time will be a market leader in crowd based rendering," he believes.

Another beta tester, Justin Dowling of JD3D, is similarly enthused. "There have been many areas that YellowDog has improved since I first saw it, and it's well on the way to being the one of the best render services I've used," he says. "YellowDog allows you to scale your operation as needed – definitely small studios and freelancers will benefit."



JUSTIN DOWLING
Justin is a CGI artist at JD3D Ltd, a Bristol-based CGI business. His work has ranged from architectural visualisations to finished animations.
www.jd3d.co.uk

"It was very easy to use and set up, and I respect that they have been seeking out artists and listening to us from the very beginning."

FYI *For more information on YellowDog and how it operates, visit www.yellowdog.co*



WIN A Fact-Finding Forest Trip to a European Paper Mill

Download Blippar app to ENTER NOW

Open app and fill screen with advert.

100% more enjoyment 70% recycled

No wonder you ♥ paper



Did you know that almost 70% of paper across Europe is collected and recycled? In fact, it's one of the most recycled materials of all! †

Magazines are printed on paper from natural and renewable wood, which is great to know if you love reading your favourite magazine.

† Monitoring Report of the European Recovered Paper Council (ERPC), 2010

To discover some surprising environmental facts about print and paper, visit www.twosides.info

See the woods... and the trees!

Win one of 30 European trips for two people to see sustainable forestry and paper making in action! **BLIPP TO ENTER** or visit **twosides.info/competition**

Print and Paper. The environmental facts may surprise you

TWO SIDES

Entrants must be aged 18 or over. Entries close 31.01.16. For full terms and conditions visit www.twosides.info/competition-terms

ARTIST

Q&A

Your software queries solved by our CG experts

EXPERT PANEL



André Roux
André has more than 10 years' experience in the digital art/game industry. He is lead production artist at Inovae Studios and Camouflaj.
www.inovaestudios.com



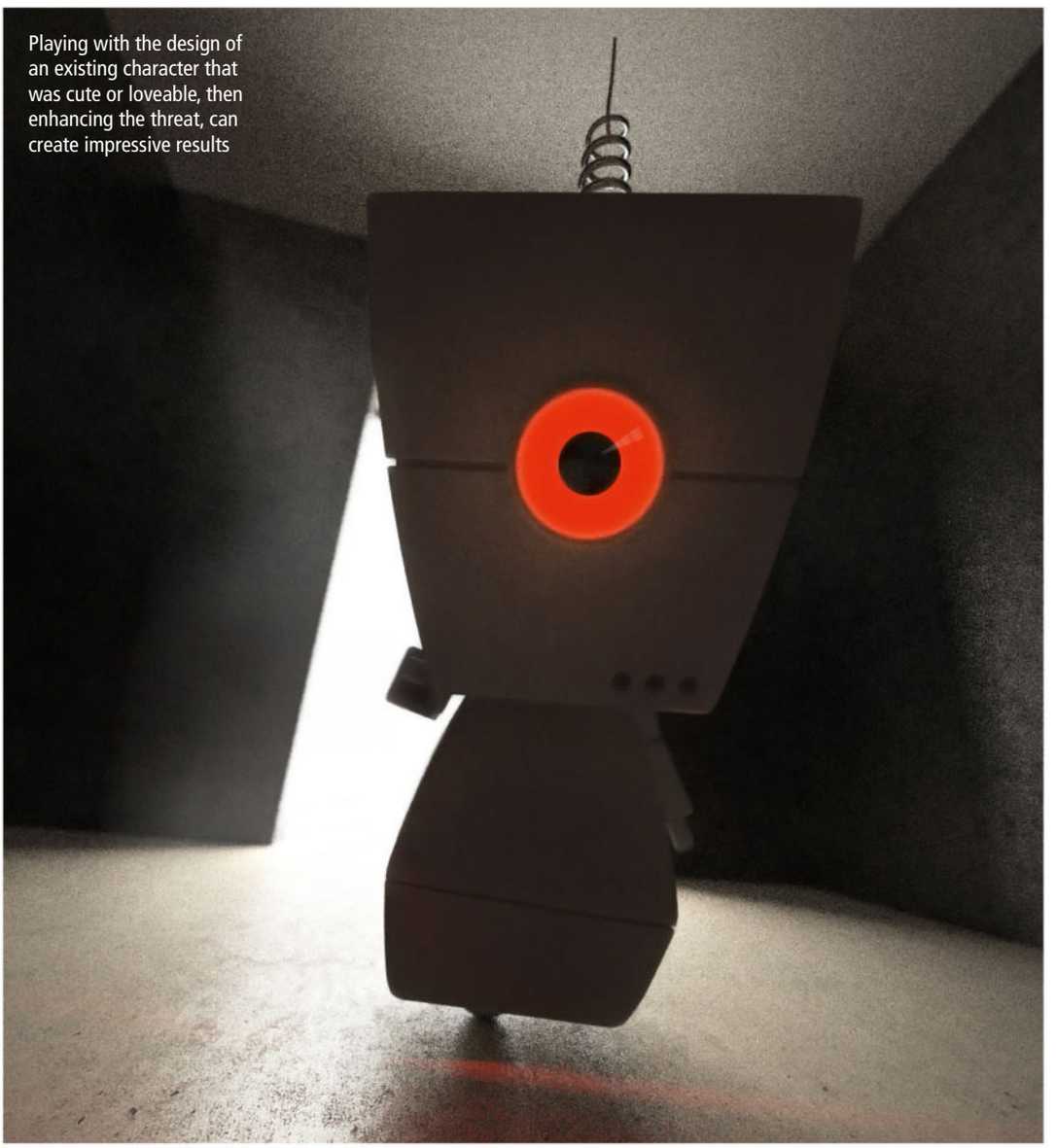
Cirstyn Bech-Yagher
Cirstyn is a freelance CG artist and educator, with over 15 years' experience in 3D. Her clients include AMD and Daz.
www.northern-studios.com



Carsten Biernat
Carsten is a senior concept designer at Unique Voodoo Studio. He is now focusing on creating 3D concept designs for games and movies.
www.uniquevoodoo.com



Rob Redman
Rob runs a 3D animation and VFX studio, working for clients ranging from governments to rock stars. He's also an industry commentator and trainer.
www.pariahstudios.co.uk



Playing with the design of an existing character that was cute or loveable, then enhancing the threat, can create impressive results

GET IN TOUCH

EMAIL YOUR QUESTIONS TO
ian.dean@futurenet.com

CINEMA 4D

How can I make my robots more menacing?

Charles Lewis, UK



Rob replies

There are two main approaches to answering questions like these. The first is all about the design of the robots themselves. If you want to make a dark, nasty, scary style of robot then work on your silhouettes; creating something either pointy and vicious, or possibly more insectoid like. This is a topic that covers a multitude of aspects – from concept art to modelling – and I'll cover that in a later article, but for now I'm going to concentrate on the second option.

For me, what can make for the scariest, most unsettling results, is playing with the themes and designs of an existing, probably cute, loveable or at least benign, character and then using your layout to enhance the threat, or hint at the menacing nature of your render. There are many ways of doing this and I'll talk about the few that I chose for my project, which is based on a cute little robot character that has graced the pages of 3D World many times – normally in its more fun manner.

First up, I made one single change to the character's design and that was to the material of his eye. Normally his eye is a simple blue-led representation of an eye, but I decided to make it a red glowing ring. Red is a more emotive colour, and to many, expresses malicious intent. It also refers to certain pop culture references, especially in this context, like HAL from 2001.

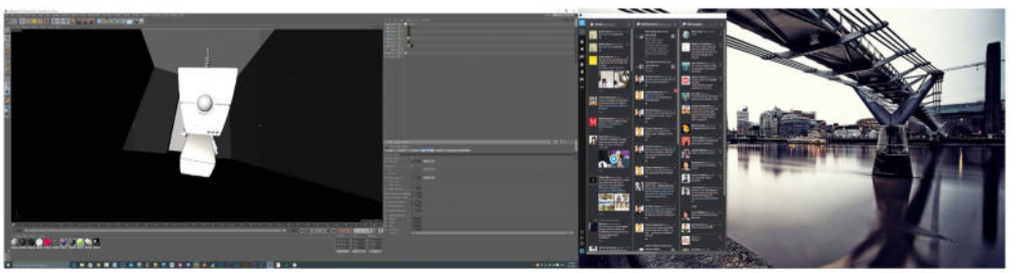
The rest is down to the camera. Firstly, add some threat to the scene, so move the camera down low – at least below the head level of your robot, so it looms over the point of view. Even if your character is small, this will help add that touch of menace that's needed. I also like the jarring feel of a camera that isn't sitting perfectly straight on the horizontal. We are all used to seeing film and TV where the camera is seated on some kind of perfect support and if it's a handheld shot the operator generally tries to keep things level – so grab your camera and tilt it on the Z axis. I also use a close camera with a wide lens to push the feeling of things not being right.

Finally, I back light the robot so all that's seen is the silhouette and the glowing evil eye. Some volume light will help to finish the shot off.

STEP-BY-STEP ADD SOME MENACE TO YOUR ROBOT RENDERS

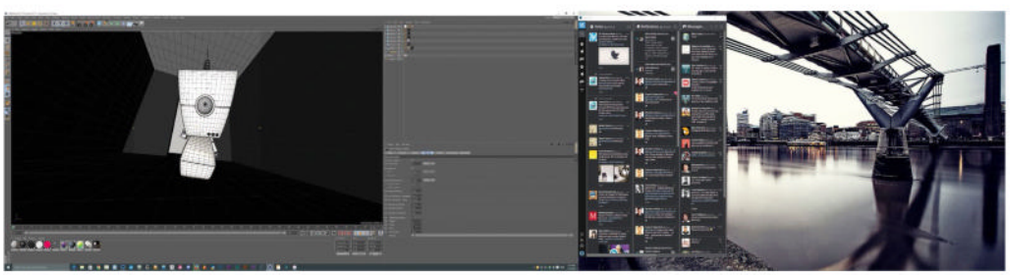
ONE ADAPT WHERE NEEDED

Some robot characters will suit a more menacing style of render better than others, so have a think to see if there's a way you can make any small adaptations to help the viewer see what you intend. This is especially helpful with a known character, where you are trying to force a mood. My little bot really needed an obvious way to make him less cute, hence the glowing red eye.



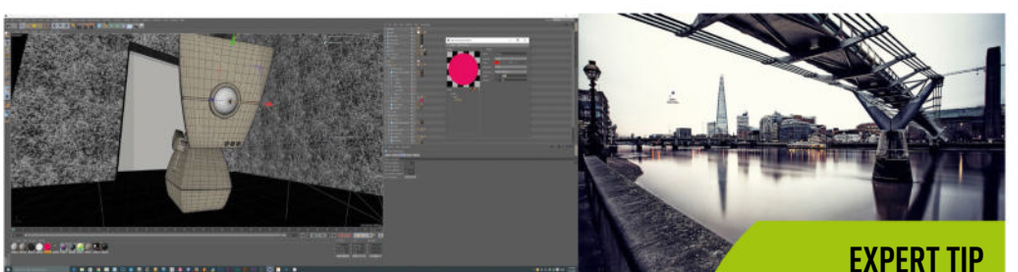
TWO UNEXPECTED PERSPECTIVE

There are a few things you can do with your cameras that will help unsettle an audience. First off, make them feel physically off kilter by tilting the camera on the Z axis. This adds drama, as well as helping the viewer feel uneasy. Next, you might want to get really close to your subject and use a wide angle lens to frame the scene. These two combined work wonders for horror shots.



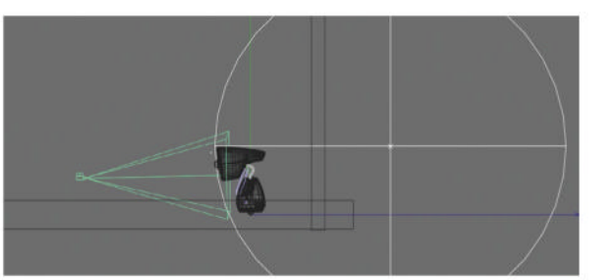
THREE DISTORTION

This is a follow on from the previous step and can be used as little or as much as you like, but a little lens distortion can go a long way. Some barrel distortion can really add to the feeling and even introduce a little nausea, which although slight, can have a big impact. Most 3D apps these days have settings for physical camera attributes, so experiment with different looks.



FOUR HIDE THE DETAILS IN SHADOW

We tend to be more afraid of things we can't see and understand, so a great trick that will help your robot look more intimidating is back light, leaving just a silhouette showing. This masks any real emotional tell-tales – if your character has the ability to show any – and plays tricks on the mind. A little volume in the scene can enhance this, so get your robot blocking the light too.



EXPERT TIP

Noir homage

Film noir used light really well to add intrigue, drama and mystery to a scene. Try combining some of the classic noir tricks with your scene to add a little something special. A simple way to get started is to add a cookie to a light. A slatted blind or a tree blocking the light can work wonders.



An in-game cockpit view of the Hellion as it approaches an unexplored planet

EXPERT TIP

Preview in game

Set aside some time for final material adjustments once you visualise your exported asset in game, where it takes on a dynamic role and isn't a static prop. Observe it within the context of other moving gameplay objects and varying lighting environments to see if the final quality holds up.

QUIXEL 2

How do I author hard surfaces for a physically-based rendered cockpit on a tight deadline?

Emily Pearce, USA

A

André replies



It's in the nature of game development that some tasks will come in hot, where you have to take a quick and dirty approach to authoring. In our case, we were launching a Kickstarter campaign for Infinity Battlescape (www.inovaestudios.com/battlescape).

We decided fairly late in the ramp-up to launch that adding a cockpit would better sell the immersion of seamless transitions between empty space and planetary atmospheres. Thanks goes to Eugene Darlak for providing the 3D model of the SFC Hellion which features the cockpit used in this tutorial, and to Kristian Ågrén and the rest of the Inovae art team for the concept resources.

Prior to production, it is key to set yourself a time frame and work within those constraints in order to hit the best quality possible without overly focusing on unnecessary detail.

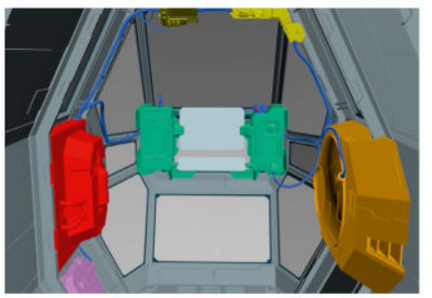
An important initial step to my process is to gather some rough reference material for surface textures. The Hellion is part of the Starfold Confederacy Faction, which emphasises an industrial aesthetic and function over form. The main art direction for the texturing was to make it look worn and used, but functional – having a rough futuristic yet vaguely familiar design.

The Inovae Engine utilises the physically-based metal roughness workflow with shaders that are comparable to Unreal 4, so I chose Unreal 4 viewport settings in 3DO to visualise my environment and textures. I also used the Unreal 4 settings on export. Whether using Unreal, Unity or any other engine, the closer you can get to a visual representation of final output materials within your engine of choice, the more accurate, non-destructive and faster workflow you will establish, as you'll cut down on iteration and switching between toolsets.

STEP-BY-STEP CREATE A COCKPIT

ONE MODULARITY

Build out various cockpit parts in a modular format, giving flexibility moving forwards in terms of organisation. This allows re-arranging cockpit features and excluding non-essential elements if time constraints become too taxing. Each individual part is exported from 3ds Max. I'll focus on one of these modular elements: a life support system that monitors and assists pilot vitals. I'm using Quixel 2.0 as my authoring package.



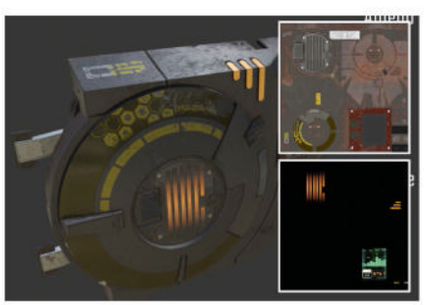
TWO BASE AND LAYERING MATERIALS

Author textures at double resolution and clamp them in engine. Unclamp them if higher fidelity is required. Layer materials in a way representative of their real-life counter parts. For this piece, I started by applying a dull aluminum material then layered rust/painted metals over the top of it. I painted out portions of the top material layers in order to emphasise wear around seams and edges.



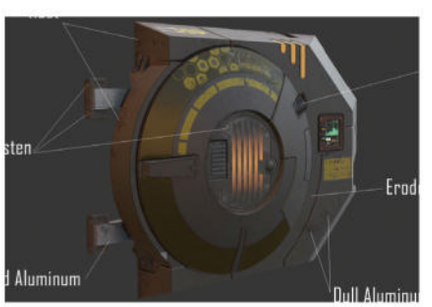
THREE EMISSIVE POLISH PASS

Use emissive details to infuse sci-fi influences into textures. This works best when complimented by placing strategic lights to draw the eye to visually interesting sections. Albedo maps should show the screens and emissive areas in such a manner that the systems appear powered down. This way, if the emissive maps get occluded in the shader for gameplay purposes, the visual default state of screens are represented as 'turned off'.



FOUR ROUGHNESS AND OPTIMISATION

Build textures within the context of surrounding objects. If materials in proximity of one another are similar, it creates an overly uniform and muddy look. Vary and contrast shiny and matte materials for visual interest and hierarchy. Importing properly rendered AO, Normal and Cavity maps allows DDO to build a solid foundation for wear build up. Pack the exported textures into RGBA channels of single textures to minimise memory overhead.



KEYSHOT 6

How do I make my mechs look rusted and worn in KeyShot?

Liam Beattie, USA

EXPERT TIP

Add a gradient

Creating renders in KeyShot works pretty well, but you always need to add something extra in post-production. Every object has a gradient; darker on the bottom and lighter on the top. Apply a gradient to the objects for a nice finishing touch.

Carsten replies

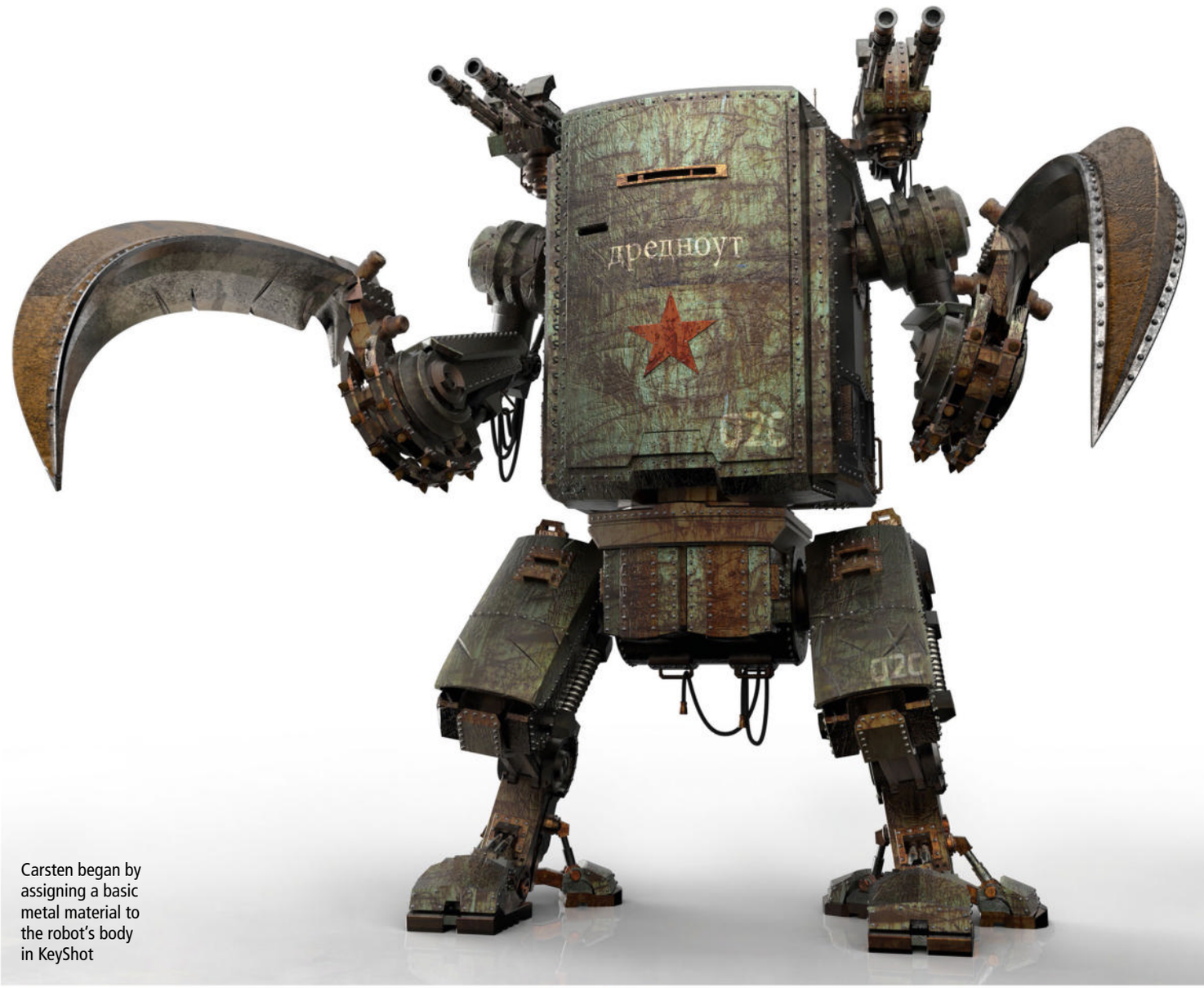


In KeyShot 6 Pro, the Material Graph is one of the key elements you can use to create a custom material with multiple textures and bump maps. At Unique Voodoo we brought our model into KeyShot using the ZBrush to KeyShot Bridge, then assigned a basic metal material to the body.

To show that a mech is battle-seasoned, like this Rusviet Unit, you need to modify the basic materials. Start by opening the Material Graph and drag-and-drop textures. The Material Graph also offers the opportunity to add different textures and utilities with a simple mouse click. My main texture of a rusty metal is used as the colour since the mixture of brown rust and yellow metal offers a good base. The first bump map is based on the diffuse map. The Bump-add palette is a very good tool that you can use to mix different maps. So, I use multiple textures as a bump and the noise fractal that comes with KeyShot. You can now separately adjust each placement and depth of the maps to achieve the look you want. The graph offers a great variety of settings and you can adjust the material very easily without affecting the original textures. To get the correct colour, I mix the material with a slight blue tone to get the green needed for that rusty copper look.

> The Material Graph in KeyShot provides a very efficient workflow to create a realistic looking texture for a convincing concept render

The Material Graph in KeyShot provides a very efficient workflow to create a realistic-looking texture for a convincing concept render. At Unique Voodoo we use this workflow all the time to show multiple options for material and colour. If the concept render in KeyShot is approved we can create the proper texture for the model. Try it yourself and experiment with your mech concepts.



Carsten began by assigning a basic metal material to the robot's body in KeyShot



QUIXEL 2 | PHOTOSHOP | SUBSTANCE PAINTER

How do I begin making good hard surface textures?

Tim Preston , UK

EXPERT TIP

Bigger isn't always better

Some 'smaller' UV mappers, like Ultimate Unwrap 3D, often work like UV mapping Swiss army knives. One of the options it offers is to export your UV map as entirely black on white, or white on black – in effect generating mask layers you can take with you into your texturing application.



Cirstyn replies

If you're new to hard surface or mech texturing, it's easy to get a little lost in the options and functionality Photoshop, or newer texturing software like the Quixel and Substance suites provide. However, if you do a little texture prep work as you go, it's much easier to get good results.

Keep it tidy, delete unused polys as you go, name your items – or at least groups – and use layers for easy selecting, tweaking and in-program map baking.

Also, be mindful of your high-poly detailing; if it's too densely detailed, your low-poly geometry may not be able to hold your normal map's detail, causing errors – and in some cases, tears in your baked map. As Photoshop can't fix this, you may have to redo parts of your model because of it.

Normals also control smoothing. A smoothing group's function is to make your model appear smoother without adding polys to the mesh. Different modellers have different tools for this, but keep in mind that where one (or more) polygon's smoothing stops, and another starts, a hard edge is created. Separate these in your UV map if you're baking normals. Even though not every UV shell needs a hard edge, hard edges do need to be separate in your UV map for tangent space normal maps. This is to give room for error-reducing tangent twisting.

Be mindful of your high-poly detailing; if it's too densely detailed your low-poly geometry may not be able to hold your normal map's detail, causing errors – and in some cases, tears in your baked map

If you're creating a wartorn and worn robot, that's full of bullet holes and grunge, consider your model's story when selecting your palette. For example, did you know that construction equipment is yellow because it's the sole colour in the spectrum that keeps standing out in any environment, even very dark ones? Or that there's a trope for film and TV mechs? Blue, cherry red, muted or earthy tones for the good guys, and blood red, navy, and unmuted, garish colours for the villains.

STEP-BY-STEP HARD SURFACE TEXTURING WORKFLOW TIPS FOR BEGINNERS



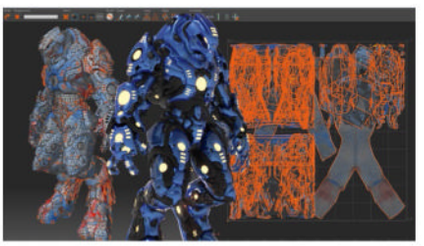
ONE UVS MATTER

Good texturing bakes come from good UV layouts. Map while your model is still low-poly, and avoid normal artefacts by cutting seams on hard edges when using Smoothing Groups. Remember to create enough space between your UV shells to facilitate edge padding and gutters.



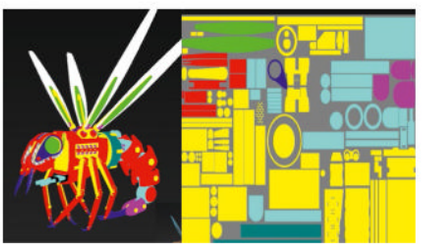
TWO UV SCALE MATTERS

Avoid the novice mistake of disproportionate UVs and thereby textures by applying a checkered UV map with colours, numbers and letters. The default black and white ones usually only show a semblance of stretch or slack, but tend to 'hide' flipped or offscale UVs better.



THREE MIND YOUR MESH

When you model, ensure your high and low-poly models are centred with each other to avoid skewed bakes, gradients, black lines, and LOD-issues later. Keep Smoothing Groups, UVs and Cage in mind, and make sure your hard edges are separated in the UV map(s) at bake time.



FOUR USE ID MAPS

Make texturing easier by creating an ID map for easy selection and masking, especially when using the Quixel suite. You can bake ID Maps in Max or Maya or Substance, or you can paint one in Photoshop or The GIMP. To avoid masking confusion, just remember that similar colours should never be side by side.



FIVE USE CURVATURE MAPS

Generate a curvature map for grungy texture masking, as it renders the bends, hollows and peaks on your model. In the map render, white shows bends or curves – which is where you'll get the most wear, grey is flat, and black denotes dips or dents which is where you'll get dirt and debris.



SIX TRY A PHOTO AS YOUR BASE TEXTURE

Photo-based textures will often read as more 'natural' to the human eye. Try using one that's not too noisy as your detailing base. The wear on a base like this can often have more 'structure' in its random components than an artificial map, and can help your detailing.



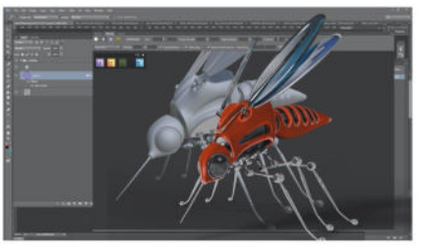
SEVEN MIND YOUR PAINTING

Detail for usage, not coolness, even though the concepts are not mutually exclusive. Typically, you'll see wear around joints, on mecha hands and feet, and wear and spillage by fuel-tanks and visible engine(s). If you're a ready-to-renderer, mix the shaders you bought with a curvature (convexity)map generated in freeware map generator, xNormal.



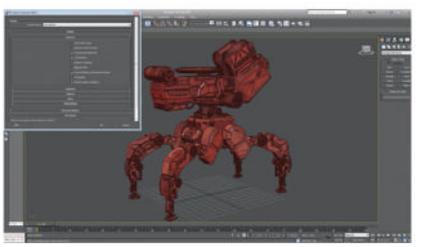
EIGHT DECAL CONVERSIONS

Sometimes you can get great decals as Photoshop brushes only. Save yourself the hassle of manually exporting alpha'd .pngs for applications like ZBrush or Substance Painter, and automate: grab freeware abrMate brush converter, and use it with user Asador's PSBrushesToAlpha script from the Substance forums. Some of the converted files may have softer edges than you want, but that's easily fixed by sharpening and tweaking them in, for example, Photoshop.



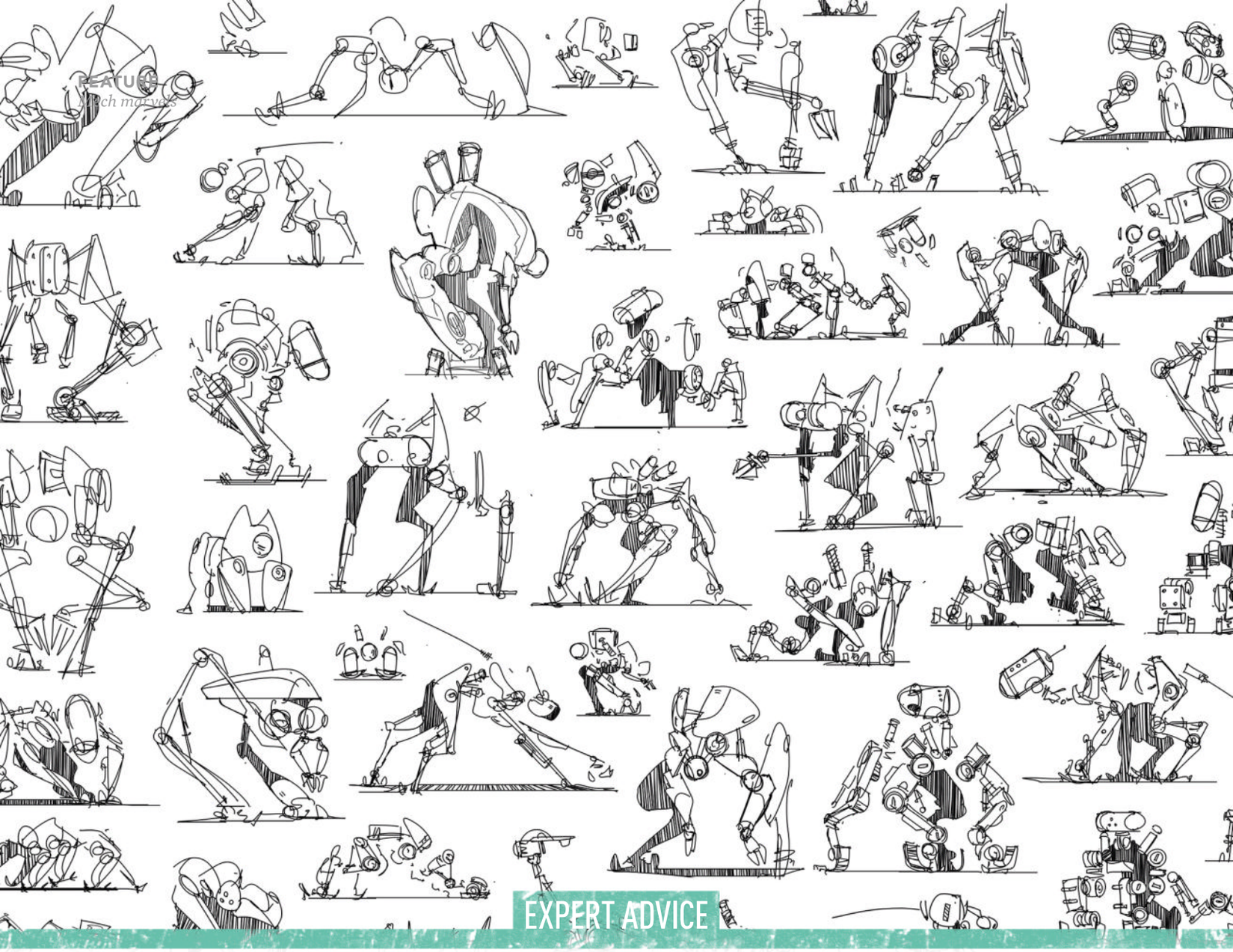
NINE LAYER IT ON

Layers of subtle build-ups always read better, so take your time when creating your wear and tear. Create scratches, smudges, flakings and dents layer by layer, set to different opacities and modes. This will read better than one big layer of damage.



TEN AND, FINALLY...

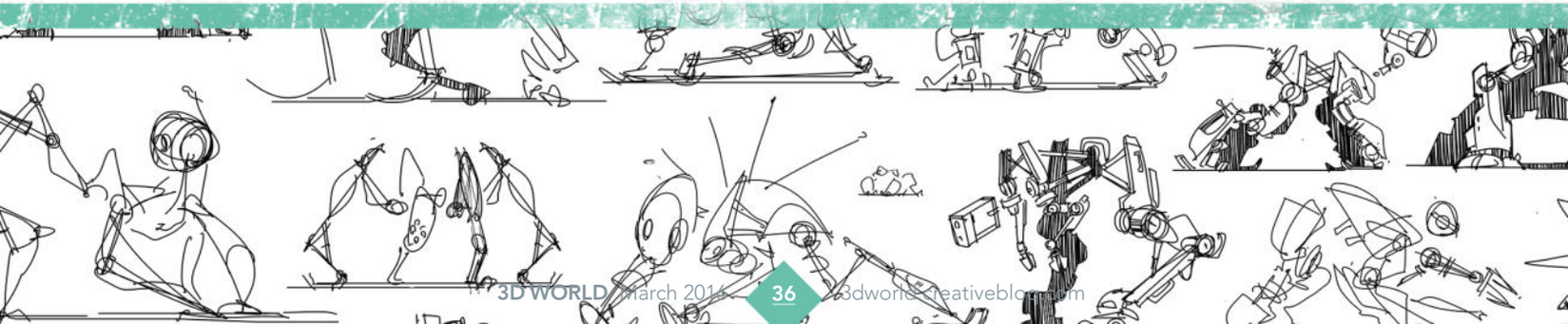
Avoid flipped UVs on your focus areas – even with a FBX export with tangents and binormals checked, you run the risk of odd light and light seams. Tris are hell to UV map, so if at all possible, UV map before you convert and test your model before you add it into your game engine.

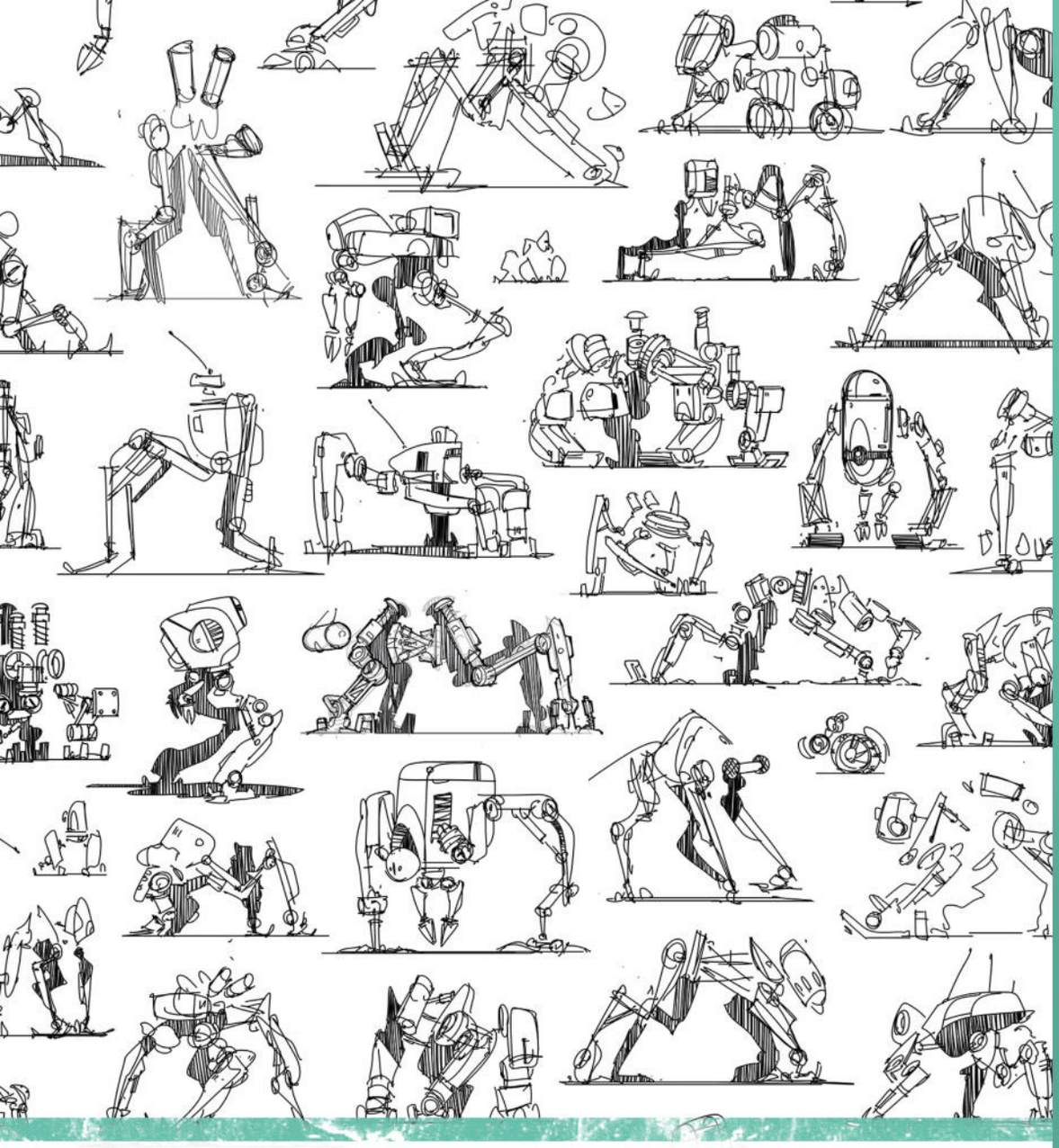


EXPERT ADVICE

RISE OF THE ROBOTS

Our expert artists share their processes and techniques for creating amazing mechanical marvels





Modelling mechs and robots can be one of the most daunting tasks you can set yourself, or have set for you. They can look complex and highly detailed, throwing up many questions – how realistic should it be? How much detail do I need to include?

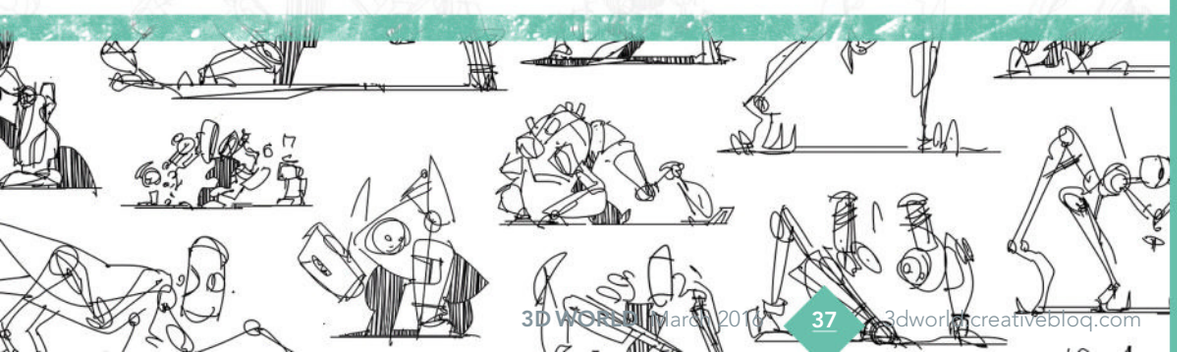
We've gathered some leading artists together to discuss their recent mech and robot projects, and to shed some light on those pressing dilemmas that could be holding you back from going 'full mech'. All good mechanical models begin at the concept stage, and artist Paul Massey is clear that kitbashing is the way forward.

"Using kitbash parts is a fantastic way of quickly assembling your concept, it just takes some ingenuity and a little design know-how with some basic 3D modelling knowledge," says Paul as he reveals the concept model for his latest mech. The GunDog Mech was created in under an hour using kitbash parts bought from Vitaly Bulgarov's website (www.vitalybulgarov.com/3d-kitbash). The site features more than 20 packs ranging from a few dollars up to $200 for large bundles.

"Knowing what you want your mech to do, and how it should operate or move is key to creating something believable," explains Paul. "I always ensure that any moving or revolving parts can do just that. Any kind of constriction on a joint or swivel point will quickly make your mech look clunky and unusable."

The first leg

Paul explains that he initially made a single leg for his GunDog Mech, making sure that it would push, pull and rotate correctly before duplicating it four times to establish the model's base. The rotational body was next, and Paul reveals a neat trick to making sure your mechanical parts work – test them with a simple keyframe animation. In this instance Paul created a simple rotation



EXPERT PANEL



Amin Akhshi
Iran-based Amin is a skilled mech modeller who mixes ZBrush, Mari and Marvelous Designer to create unique mechanical concepts.
www.artstation.com/artist/amin



Tor Frick
Tor is a 3D generalist with a love for machines, working as technical art director at MachineGames, most recently on Wolfenstein: The New Order.
www.torfrick.com



Nadeera Gunasekara
Nadeera is 3D modeller at X10 Productions, a film and advertising production company based in Colombo, Sri Lanka. Their clients include Unilever and Pizza Hut.
www.artstation.com/artist/nadee77ex



Paul Massey
Paul works in motion graphics at McCann Manchester. He mostly works in TV advertising, from video editing to 3D modelling and character sculpting.
www.artstation.com/artist/zeclipse



Valeriy Orlov
With over eight years' experience in film and video games, including The Godlike, Valeriy is founder and art director of Magix FX and Valart Studio.
www.valeronart.com



Furio Tedeschi
Furio is a renowned CG artist from Johannesburg, South Africa who works in the video games industry at studios including BioWare Montreal.
www.smokeflames.blogspot.co.uk



Matt Tkocz
Matt is an experienced concept designer in the film industry who has previously been a digital painting instructor at Gnomon School of Visual Effects
www.tkoczportfolio.tumblr.com



Jörn Zimmermann
Based in Hannover in Germany, Jörn is a UI designer at Ubisoft Mainz and has experience of 2D and 3D concept design for the video game industry.
www.z-ground.com

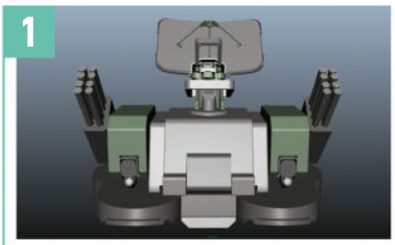


MODELLING THE MARS MECH

Amin Akhshi reveals how he mixed Marvelous Designer into his mech modelling workflow

EXPERT TIP
Make it real
The level of believability is the most important thing in mechanical design, which you virtually have to represent on your artwork.

1

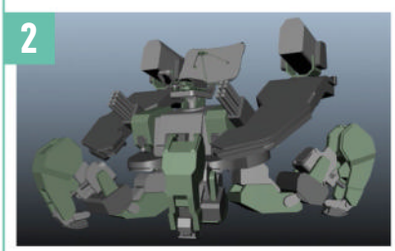


START WITH SIMPLE SHAPES

I start from a simple basic shape; a cube and a cylinder in Maya. At this stage I'm not worried about the details, I am just trying to figure out how and where the parts are going to join, and which parts are going to have movement. It's better to use different colours for each part and group them accordingly.

EXPERT TIP
Reign in your references
Do not overuse references or concept ideas. It is best to play with different shapes and find new ideas. By doing so, it will assist you in becoming a great designer.

2



CREATE A QUICK RENDER

When I'm done with the basic mesh of my model, I do some quick renders from different angles in KeyShot, the real-time renderer, to see how it's looking. Before moving on to the next step, I have to check and make sure each element is in the right place and connected to the right part.

EXPERT TIP
Create a kitbash library
Making small parts does not take much time. It is best to create a kitbash of your own. This can save you time in designing something and you can learn plenty from it.

3



WORK ON THE DETAILS

When I'm satisfied with the base mesh I work on details, piece by piece. For illustrations you don't need to pay attention to quad faces and a clean mesh. Also, you have to be careful not to do it too much otherwise it's going to create confusion when you look at the model.

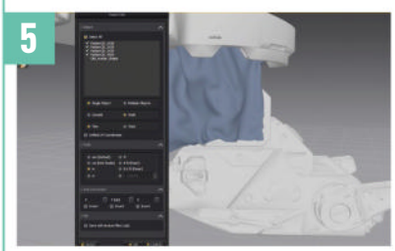
4



MAKE USE OF KITBASH PARTS

I use some kitbash pieces around the model to fill the empty areas. It can be helpful to work quickly on your design and to make new parts quickly. Sometimes I combine two or three parts of a kitbash together to make a new, complex, hard-surface shape and use it on my model to have some busy areas.

5



USING MARVELOUS DESIGNER

For the next step, it's time to go to Marvelous Designer and create a cloth cover to connect the legs to the body. I import my model to MD, but not the whole model, just the parts that I need to connect using the simulated cloth. When you export the cloth cover as an .obj file, you have to use the Weld option.

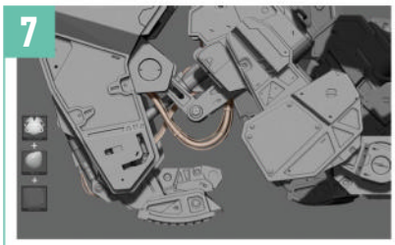
6



IMPORT CLOTH TO ZBRUSH

I import the cloth cover into ZBrush and use ZRemesher with the default setting to get a clean quad mesh. Then, in the Panel Loop menu, I use Elevation -100, Polish 1, Loops 1, Bevel 0. Note that the thickness depends on the size of your mesh. I then use the Move brush to cover the parts I want to connect.

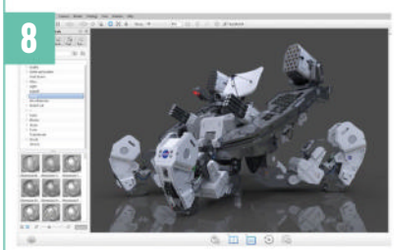
7



ACCURATE DETAILS IN ZBRUSH

At this stage I import the whole model into ZBrush, and I create some cable parts with the Curve brush. I also use the Move brush with low intensity for greater accuracy. Then I add some details and extra small parts with the ZModeler brush, which was introduced in ZBrush 4R7.

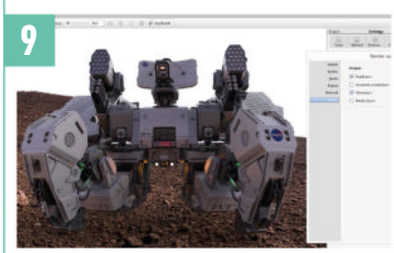
8



MATERIALS IN KEYSHOT

After importing my model into KeyShot, I use a couple of metallic colour materials to create some separation between parts. This helps the mech's shapes read better. After this I add some decals, such as the warning signs and some text markings that I made earlier using Photoshop.

9



THE FINAL RENDER

For the final render I use Maximum time and let KeyShot give me the best render. Before saving the final image I go to the Passes tab and select Clown and Depth passes. These two options help with compositing. Finally, I save out the render as a .png file, using the alpha function to retain my layer passes.



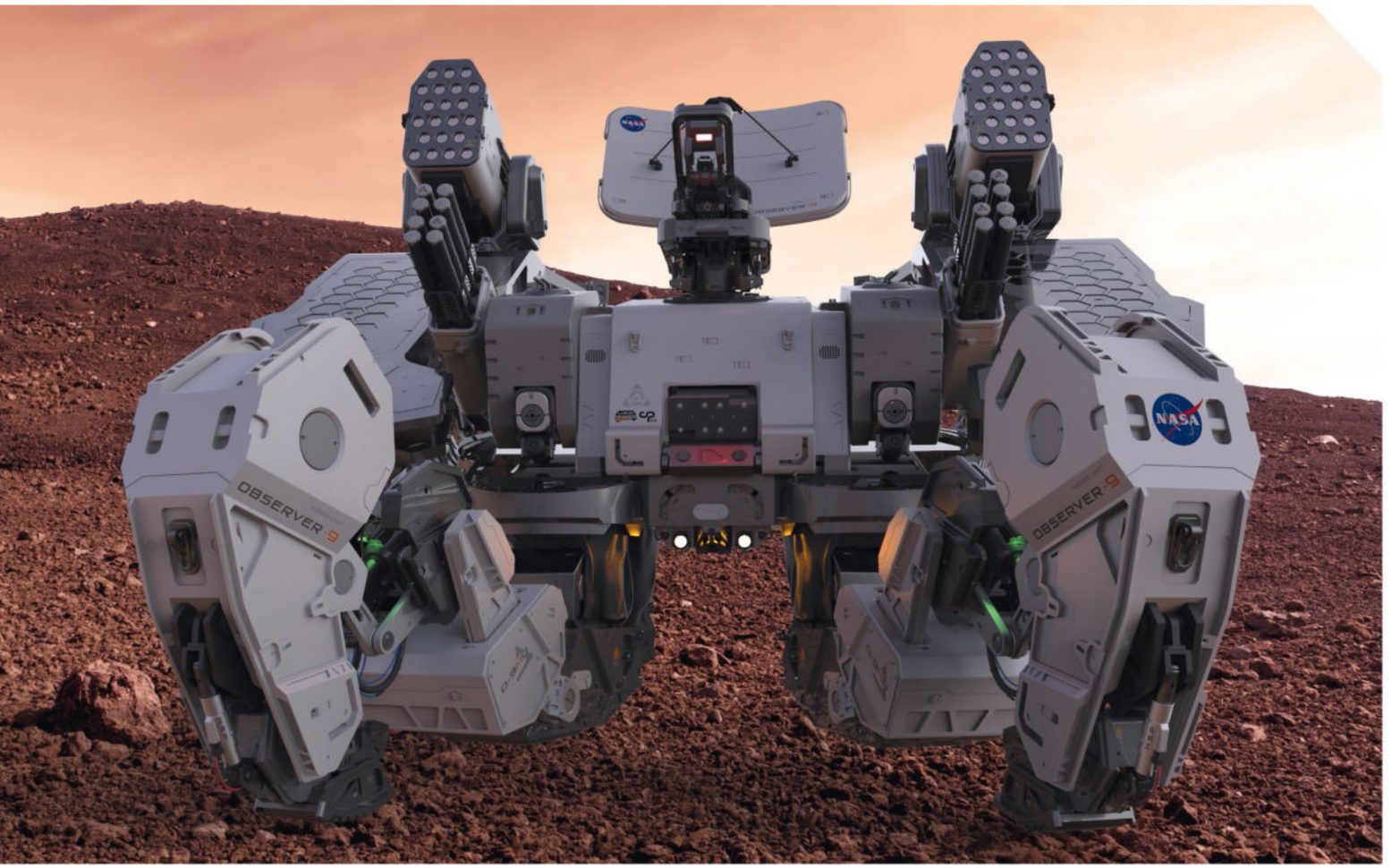
animation of the base before moving on to create the head, which houses the main weapon (see the image on page 40).

"A weapon such as this would require a lot of ammo, so I addressed this design problem by adding three large drums of ammunition in a unique way, which helps make the mech stand out and, again, appear believable," says Paul. "I then exported the model from Cinema 4D using GoZ to ZBrush, as I wanted to utilise KeyShot for its ease of adding basic textures and finding a good camera angle to display the mech at its best."

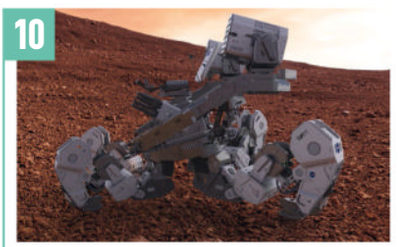
Once imported, Paul divided the model into separate parts using Groups Split and pressed the PBR button to send the model to KeyShot using the built-in bridge. Once inside KeyShot, he carefully picked a colour palette, and began to make several groups labelled by the materials he wanted to assign to each piece.

Eventually Paul had all the parts separated into groups, such as main armour, bright metals and plastics: "I import my chosen backplate and begin to set up a camera angle, which I then lock and save," he says. "A suitable HDRI is used, taking

RED ROBOT
Amin Akhshi's martian mech is a mixture of sculpted forms and kitbash parts

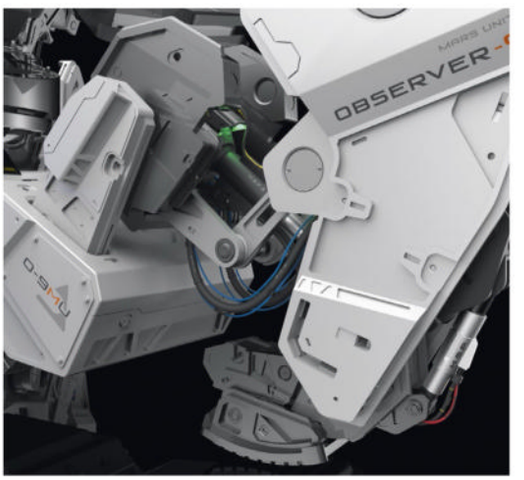


10



PHOTOSHOP ADJUSTMENTS

I add a background from an HDR map in Photoshop. To select a part from my model, I use the KeyShot Clown pass. You can use the Depth pass as an alpha channel, but you have to go to Adjustment>Exposure and play with the options to get a depth pass that suits. Finally, try using an alpha in Lens Blur.





into account the light source of the backplate to add authenticity. I then rendered a beauty pass and a separate ground shadow."

Martian mechanoid

Amin Akhshi, a freelance 3D character artist based in Iran, took a little more time to piece together his latest mech project. Amin created the mechanised planetary explorer, Observer 9 – Mars Unit (pictured above), in a month during his spare time. Amin, whose main 3D passion is sculpting in ZBrush, revelled in the chance to expand his creative horizons when modelling and rendering a mech.

"The technical design knowledge I learnt when I was working on this project was the part that I enjoyed the most," he says. As for experimenting with new skills, Amin explains that,"for the illustration I wasn't worried about quad faces or clean meshes, I just wanted to set up the parts as fast as possible. For this I used the cut tool and the Boolean function."

Noticing everyday details that people don't usually pay attention to is one of the foundations

> The level of believability is the most important thing in mechanical design. It's best to play with different shapes and find new ideas
>
> *Amin Akhshi, freelance concept designer*



CREATE A MECH CONCEPT

Paul Massey shares his process for putting together a concept mech beauty shot



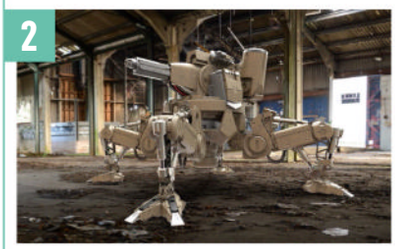
1



SET UP RENDER PASSES

The model's materials are set up in grouped folders, so it's a simple task to render several passes. A Clown pass can be used for easy selections in Photoshop. I render a Beauty pass with an alpha channel, then a Shadow pass by making the mech a flat white so I can multiply the shadows in Photoshop later.

2



BACKPLATE AND ALIGNMENT

When choosing backplates I prefer a background that isn't too distracting. Use walls or windows to match the perspective and then save your camera. I try to use an HDRI that matches the lighting, and also try and match the angle of shadows to make the model appear situated within the scene.

3



OVERPAINTING

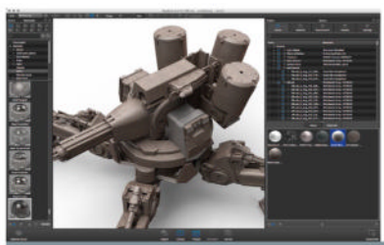
In Photoshop, I take a rough-edged brush and pick out small areas that would be prone to rust and scratches. Multiple faded layers work better than one strong pass. Pay close attention to the materials of your mech – each element will deteriorate or suffer damage in different ways.

4



ADDING ATMOSPHERE

I used images of smoke to lift the mech from the background and to highlight its shape. I've also added graffiti to make it appear as if it's been abandoned and to tie the whole image together. I added light rays to embed the render further, and a final weathering detail pass completes the image.



GUNDOG MECH
"This GunDog Mech concept art was designed and rendered in just five hours," says Paul Massey

EFFICIENT KEYSHOT MATERIAL EDITING

Spending time to group your model's parts will make exchanging materials and textures a more fluid task than having to switch parts individually. This model has over 400 parts, but grouped into five folders for their materials. I can change each of the grouped parts' materials without having to worry about selecting each component. This simple organisation will greatly speed up your concept illustration.

underlying Amin's art. "The level of believability is the most important thing in mechanical design," he explains. Despite also being inspired by nature and other artists in the gaming industry, Amin is careful not to overuse references or concept ideas. "It's best to play with different shapes and find new ideas," he says. "By doing so, it will assist you in becoming a great designer."

Eye to eye

From a giant space rover to something smaller – artist Nadeera Gunasekara chose to focus on one mechanical component, the eye, for his project. Nadeera uses his personal projects to experiment and test new techniques; here he looked at how to improve his robotic textures using Mudbox.

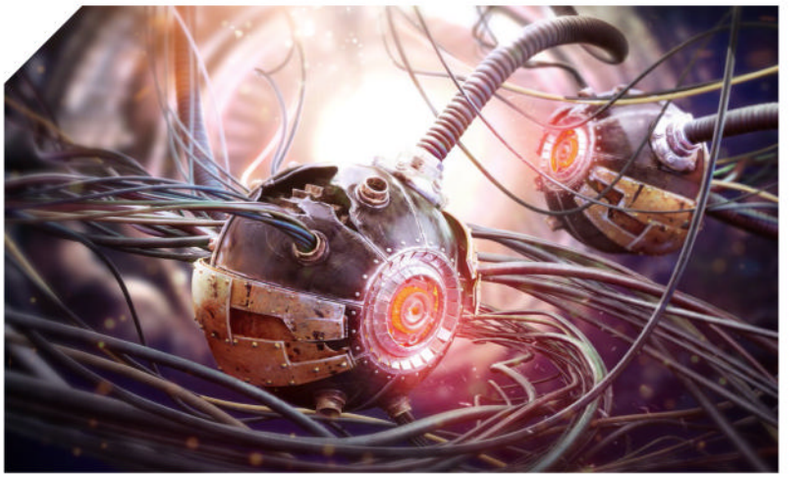
"I wanted to bring life to a dead thing using mechanical stuff. So I chose the human eye," he says, adding that he created the sketches mentally, and jumped straight in to modelling.

"I learned lot of things from this project," comments Nadeera, who used the robot eyeball project to test his workflow, developing the eye from low-poly concept, blocking shapes



THE HUMAN EYE

"Personally, I most like modelling robots and mechanical stuff because there are different and complex shapes," says Nadeera. "I really enjoy painting scratch marks and grunge marks in hard surface texture painting"



EXPERT TIP

Keep calm

I have some simple advice: don't rush and always try and be original and creative. Start simply and build on strong ideas.



ILLUSTRATING A ROBOT

Matt Tkocz created this robot for the book Nuthin' But Mech 3. However, the project wasn't smooth, with Matt failing to follow his own rules: "I didn't figure out the robot's specific function and It was kind of all over the place," he confides. "To me this piece was mostly story-driven, which was fun for illustration purposes but left me a little lost when it came to the actual robot design. Worried that the lack of purpose would make the design too generic, I decided to push the shapes as far as I could without sacrificing believability."



POSING

Playing with posing helps to bring out the character of your robot. Here I went for a graphic treatment.

CREATE A STORY

Thinking about corporate identity and graphic design is fun and an easy way to push realism and believability of your design.

ADD DECALS

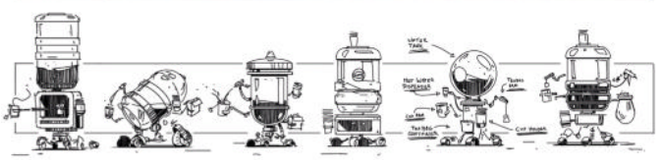
Decorating the image with a few phony call outs and graphic designs can contribute to the way the viewer perceives, experiences and judges the robot design.





THUMBNAILS

"I leave no stone unturned while forcing myself out of my comfort zone. There is no such thing as too many thumbnails," says Matt



EXPERT TIP

Learn shape language

Practise creating new design. Reducing a design to its essential components, for example, will help to sell its believability. This Tea-Maker Robot design (bottom left) was a practice to keep refining shapes. Also, I avoid humanoid robot designs whenever possible.

and forms, before turning to Mudbox for hard surface textures and details. "Prior to texturing I did research on mechanical equipment, then I collected textures from Google. I created my own stencils and stamps for paint scratch marks, and in this case, grunge marks."

When it came to creating the wires flowing from his robotic eyeballs, Nadeera identified a number of ways to make them: "There are a few ways to create wires and fibres in 3ds Max. First I created a helix under Shape Category, then I converted this to a wire and played with the parameters of the helix. Once done, I duplicated and rotated it to create a bundle of around 10 new wires. I then selected all of these wires and grouped them together. Finally I added an FFD Box modifier and bent it how I wanted."

Give it purpose

Artist Matt Tkocz considers grasping why a robot exists, its role and purpose, as a priority. Function defines form. "In the real world all man-made objects are created to serve a very specific function," says Matt. "When I come up with

> At the end of the day I don't think anyone cares about 'cool looking stuff' unless there is the human factor involved
>
> *Matt Tkocz, concept designer*





NAZI WAR MACHINE
These high-poly renders were created by Tor for the release of Wolfenstein: The New Order

MODO MECH
This mech is one of Tor's personal projects, which was built and rendered in Modo to test new workflows

robots I usually try to narrow down their purpose as specifically as possible. In the real world, all-purpose robots don't really exist – every machine is designed to do one job well."

Once he knows what the robot's job is, and what components it needs to do that job, Matt sketches simple thumbnails at speed to "juggle around [the robot's] components into a variety of different configurations".

Matt suggests that once you've found a direction to take your design in, you should then spend extra time looking for ways to optimise it, to improve, iterate and develop the core idea. "My first ideas are rarely my best, so everything I do always goes through tons of iterations," he confides. "I do a lot of sketches and play with different possibilities every step of the way to make sure I don't overlook an opportunity to squeeze every last drop of potential out of the final image."

Once all the important design decisions are made, Matt switches between modelling, further sketching and posing, "while slowly massaging the piece to finish."



ARTIST Q&A: TOR FRICK

What software or tools do you use and why?
My main software is Modo; I'm a big fan of its hard-surface modelling tools, and the customisability of it. Sometimes I use Marvelous Designer, ZBrush or 3D Coat, depending on what I need. For cloth in general I use Marvelous – for someone like me who's not exactly a sculptor it's perfect – while I use ZBrush for various minor sculpting tasks, and 3D Coat for natural elements, such as rock formations and so on.

When mixing retro references and mechanicals, is there a knack to making them work in harmony?
One of the mistakes that's easy to make is to combine too many different references. If you draw inspiration from too many sources it's easy to dilute the style you're going for if you're not careful which elements you bring in. If you want to mix things as it is, combining retro and mech design, it helps to focus on a few strong aspects. It's easy to create a cluttered design by simply bolting lots of small elements on top of an existing mech core design, instead of merging the two.

What was the biggest challenge when creating mechs for Wolfenstein?
The biggest challenge was to build something that looked visually impressive, while still being able to fit within the technical limitations (a very low polycount, for example). The robots have destructible armour so they needed insides as well, and it all had to fit within the polycount. I needed to adapt designs on the fly to simplify shapes for the low-poly version to work.

How much planning is needed when working on a mech model, particularly for video games?
Not that much. I normally start out by making a complete functional blockout of the model, so I can iron out any rigging or animation issues early on. This model is very simplified while still containing all the major shapes and features. It's very quick to make and allows for very quick iteration on design problems. After that, I can just start digging into the modelling without having to figure out too much along the way.

What advice can you offer to readers looking to mix influences in their mech models?
Focus on strong influences that are easy to read, such as larger shapes, materials or unique design attributes. Repeat those influences across the model – you want it to be a theme, not an alien element. It's easy to add minor influences and think they're obvious, as you're the one who added them. Someone looking at your model for the first time is likely to miss or misinterpret them.

WATCH FURIO'S ZBRUSH SUMMIT DEMO HERE:
www.bit.ly/205-zbrush-summit

SOFTWARE BUG
Furio sculpted this robot Mantis for 2015's ZBrush Summit



ARTIST Q&A: FURIO TEDESCHI

Do you always start with a pen sketch when sculpting robots. If so why?
No, not really. I try to use any method that helps me – sometimes it's sketches and sometimes it's just jumping straight into a 3D package and working up ideas and forms.

What is the advantage of using IMM brushes?
The advantage is that they can speed up your process for the minor details or background noise on your hard surface model. [You can download Furio's IMM tech parts used for the ZBrush Summit 2015 from this issue's Vault.]

Do you create your own custom IMM brushes? Can you offer any advice to readers when using IMMs?
Yes, I like to create my own but also use others' IMM brushes. It's good to use IMMs but don't let them dictate your design, as it might start to look like the work of the IMM brushes.

What do you make of the Toon Shader in KeyShot? Is it good to experiment with these features?
It's good to experiment with any of the features in KeyShot, as you might not know what to do with them unless you play around with them. Plus, the Toon Shader is super fun and gives a nice traditional artwork quality to the CG renders.

What do you think is the advantage of using KeyShot for robot sculpts?
KeyShot is very quick and simple to use. It helps with quick material setups and lighting solutions, but there's no real advantage to using it for rendering robots.

Watch Furio's video training for hard surface modelling, in which he sculpts a Japanese-style robot: **www.bit.ly/205-furio**

Form following function

The purpose of a mech or robot is as key to Jörn Zimmermann's modelling as it is to Matt's – once again the function of the model inspires its design. In fact, Jörn sees this as the thin line between a great robot model and an average one, pointing out a common mistake for many models is their inability to move and flex joints.

"Sometimes the models look cool but when you take a closer look, they could never turn their head or flex or rotate an arm. Of course, I have been guilty of this too! That's why I try to improve on this, among other areas. Nowadays, I try to be aware of what the purpose of the robot is and how it's supposed to move," says Jörn.

Software of choice for Jörn is ZBrush, and he chooses to use DynaMesh spheres and standard brushes for the more organic parts (Move, Clay Buildup, Trim Dynamic, hPolish, Dam_Standard, Trim Curve).

"A set called MAH Brushes, offered by MAH Studios, is also really helpful for hard surface sculpting," advises Jörn, adding that for the mechanical parts, he often uses IMM (Insert

> Sometimes the models look cool but when you take a closer look, they could never turn their head or flex or rotate an arm
>
> *Jörn Zimmermann, UI designer, Ubisoft*



CONCEPT PROJECT

Valeriy Orlov shares the importance of creating an effective concept design within a wider world

Valeriy Orlov's Weapons For Peace is an open-source project that he hopes will inspire artists to rethink how weapons are used and created. "Weapons must be used in a very limited case and only as a demonstration of force, aiming to protect civil people and not as an act of physical aggression to pursue someone's selfish goals," says Valeriy. In a sense, he wants artists to create 'defensive weapons'.

His initial robot concept is the MMCS RATNIY M09, created as a modular design so artists can see how each piece fits together and can be developed in new directions. "This character is simple and can be easily understood by everyone. I think that it's not quite the right strategy to start a big open-source project with complicated characters," says Valeriy.

Valeriy explains his concept process and encourages you to adapt and reinvent his idea into something else. Can this be turned into a weapon for peace? A medical, construction, or agriculture robot, perhaps.

> It's necessary for the audience to believe in your character. You shouldn't save your time and strength on this
>
> *Valeriy Orlov, art director, Magix FX*

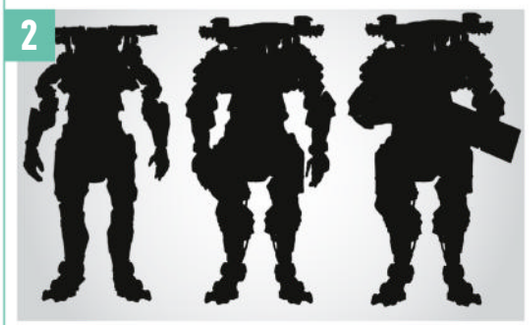
1



REFERENCES

I didn't want to create something futuristic; I wanted to create a character anyone can believe in, which means it should consist of known forms. So I took photos at an outdoor museum of military machines for reference.

2



FIND THE SILHOUETTE

Having gathered all necessary material, I began working. It took some time to discover how my references and shapes fitted together, but very soon I figured it out, and the first concept silhouette appeared.

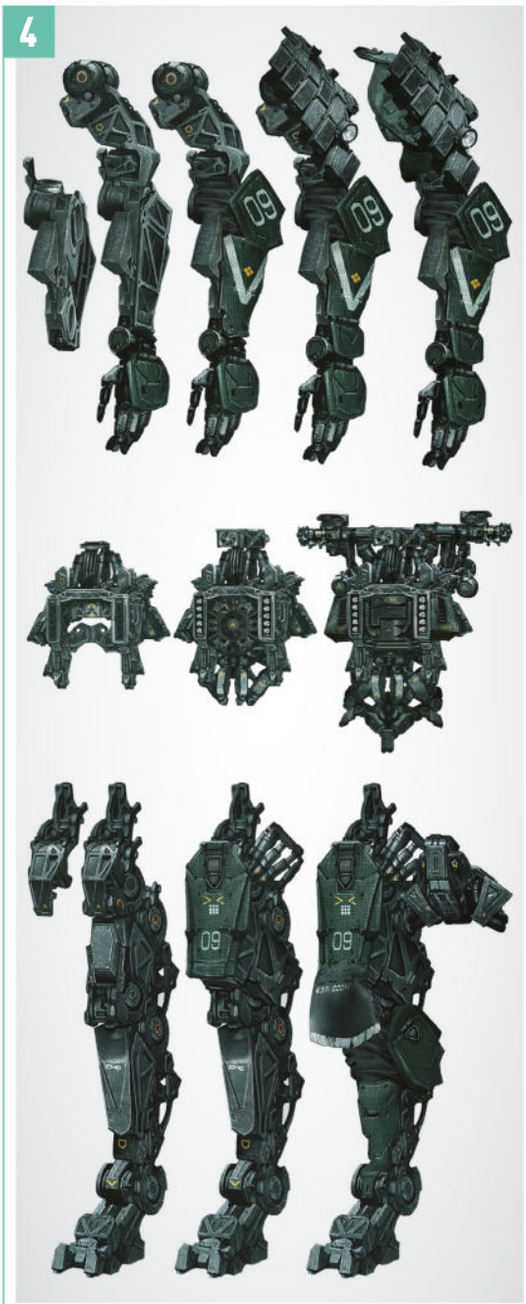
3



HOW WILL IT MOVE?

Once I had the forms and design in place I began thinking about how the mech should walk, bend, carry weapons, and so on. This required another round of reference gathering, focusing on smaller elements and details.

4

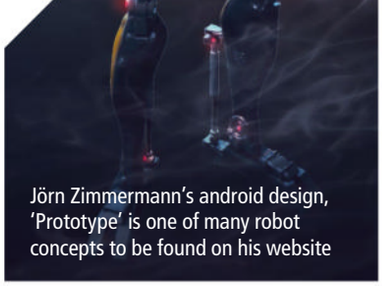


MODULAR DESIGN

Once I'd devised how it's going to move and work, I divided the design into parts and thought about how a robot like this will be manufactured. This included designing the main processor, as well as different safety and life-support systems.







Jörn Zimmermann's android design, 'Prototype' is one of many robot concepts to be found on his website

Multi Mesh) brushes and tries to build believable mechanical elements out of the parts.

Jörn recommends using a combination of DynaMesh sculpting and IMM brushes to speed up your mech blocking-in process: "I think getting used to ZModeler efficiently could improve the workflow. Also, I found the new Autodesk Fusion 360 quite interesting to speed up the process for the mechanical parts… and of course, practise is key!"

Once you have your mechanical creation modelled, its form and function set, it's time to layer on the extra details that will bring those hard surfaces to life. Valeriy Orlov turned to Photoshop to create his decals, brands and designs for his Weapons For Peace project. He says approaching decals is a matter of thinking big, imagining a world around your mech.

Devil in the decals

"You need to think about logos of imaginary companies thoroughly to make sure your robot doesn't look handcrafted, like it was created in some garage by local guys," explains Valeriy. "You

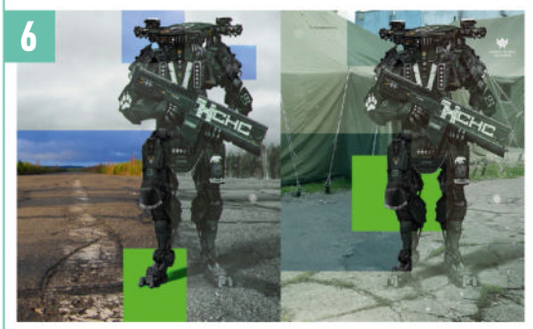
JOLLY GREEN GIANT
Valeriy Orlov's war robot takes influence from Russian military hardware and Japanese mecha



5

WEAPON DESIGN

As well as thinking about the shape and design of a military robot, I also created the weapon design. I thought over everything, from the number and shape of the bullets to the technical characteristics needed to achieve a realistic concept.



6

COLOUR AND DECALS

I considered the armour colour and additional asymmetrical details that will make the robot look realistic, as well as logo locations on the final stage of the concept. All that was left was to insert the concept into an environment.



need to make sure it's a part of a huge industrial production. You need to think what goods your imaginary plants make, how they work together, what components they provide and who will be the main publishing brand."

All the images you create should be in one style, they should blend together in one piece. To this end, Valeriy suggests looking through a number of various industrial references, with real marking logos on their components. This will help you to create realistic images and place them on the right parts of your concept.

"And remember," adds Valeriy, "whether you are working on a single concept or a big project, the main goal of the markings and logos is to create the feeling of a whole new imaginary world around your character, not just to place cool-looking decals all over it. It's necessary for the audience to believe in your character. You shouldn't save your time and strength on this. No matter how difficult it is and how much time you spend, this is your final touch."

FYI *Download IMM brushes and step art from* ***www.creativebloq.com/vault/3dw205***

> You need to think about logos of imaginary companies thoroughly to make sure your robot doesn't look handcrafted
>
> *Valeriy Orlov, art director, Magix FX*

INSPIRING CG ARTISTS

3D WORLD

ARE YOU A CG PROFESSIONAL? GET OUR PRO PACK ON PAGE 53

SUBSCRIBE TO 3D WORLD

Whether you want 3D World delivered to your door, device, or both each month, we have three great options to choose from. Choose your subscription package today…

SAVE UP TO 54%
Based on an annual subscription



	PRINT	DIGITAL	PRINT & DIGITAL
UK	£55.00	£45.00	£66.00
EUROPE	€99.00	€60.00	€126.00
US	$131.00	$60.00	$158.00
REST OF WORLD	$140.00	$60.00	$167.00

SUBSCRIBE TODAY

www.myfavouritemagazines.co.uk/3dmag16

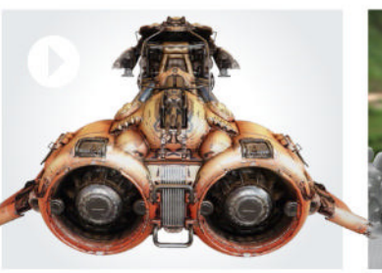
TERMS AND CONDITIONS Prices and savings quoted are compared to buying full priced print and digital issues. This offer is for new subscribers only. You will receive 13 issues in a year. If you are dissatisfied in any way you can write to us to cancel your subscription at any time and we will refund you for all unmailed issues. Prices correct at point of print and subject to change. For full terms and conditions please visit: myfavm.ag/magterms. Offer ends 31/03/2016.

CONTENTS

TUTORIALS

Practical tips and tutorials from pro artists to improve your CG skills





54 GET STARTED IN QUIXEL 2
Top tips to master the latest texture app

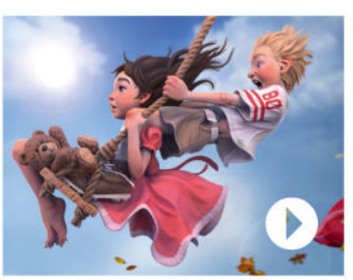


60 RENDER A STILL LIFE SCENE
Part 4: Create and apply texture maps



48 MASTER MECH MODELLING
Create a tank-inspired walking mech

62 CREATE FOLIAGE FOR ARCH-VIZ
Ryan Groves shows how to use 3ds Max plug-ins to create detailed vegetation



70 IMPROVE YOUR SCULPTS
Add personality to your 3D art



76 GROW REALISTIC TREES
Get started with Blender's new plug-in



78 CREATE A DYNAMIC DRESS
Master the Marvelous Designer 5 process

FOR MORE ON YOUR **FREE DOWNLOADS & VIDEO TRAINING** TURN TO PAGE 6

GET YOUR RESOURCES

You're three steps away from this issue's video training and files…

1. GO TO THE WEBSITE
Type this into your browser's address bar: www.creativebloq.com/vault/3dw205

2. FIND THE FILES YOU WANT
Search the list of free resources to find the video and files you want.

3. DOWNLOAD WHAT YOU NEED
Click the Download buttons and your files will save to your PC or Mac.

3DS MAX | CORONA RENDERER | MUDBOX | PHOTOSHOP

IMPROVE YOUR MECH MODELLING SKILLS

Tomi Väisänen shows how to design, model and render a tank-inspired walking mech



ARTIST PROFILE
Tomi Väisänen
Tomi is a 3D artist at Ubisoft RedLynx, and is from Helsinki, Finland. Working in the advertisement and game industry for several years, Tomi also fits in personal projects when he can.
tomivaisanen.com

In this tutorial I'll explain my workflow for creating a convincing and detailed mech, scarred by battle damage and completed with worn, grime and grunge textures. I will guide you through all the steps, starting from the gathering of reference images, which will give you a clear vision of where we are going. After that, I will plan and sketch out the model in 3D primitives.

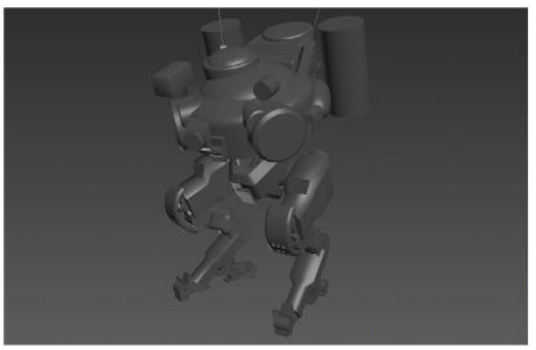
I will show you how to survive the stress of crunch time by speeding up your process. I'll also share my process for modelling complex forms with standard poly-modelling tools, as well as generating some nice wear and tear automatically – without having to unwrap that much – to speed up your workflow, without compromising on quality. I will talk about the importance of kitbash assets and how to implement those to your model.

For the rest of the tutorial I will focus on compositing my model to make it look really realistic. We'll look at blending modes and creating those happy accidents that can lift your mech model to the next level. The challenge of modelling a mech like this is the sheer volume of work. There's lots of things that need to work out correctly for the design to be plausible – from the main form to the tiniest detail. Modelling this piece of work took me a few weeks and most of the time was spent on just plain modelling.

To follow this tutorial, you should have a basic knowledge of the production of 3D modelling, because I won't cover all the tools and details. We will be using 3ds Max, Corona and Photoshop. I hope you will learn something new, or at least get inspired.

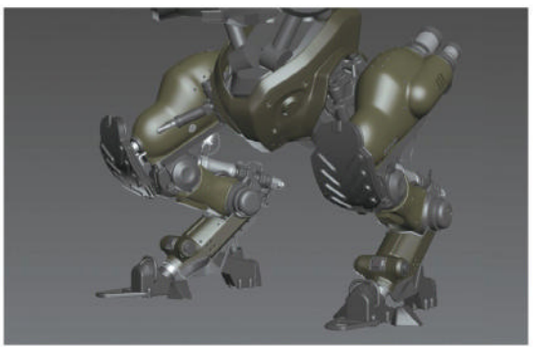
My inspiration for this mech came from the Maschinen Krieger model kits. I'm a huge fan of big, rusty and battered war machines that make me want to dive in and model every nut and bolt. But first we need to gather references. Besides the Maschinen Krieger models, I also gather images from old Vietnam-era tanks. Keep in mind, references for hard surface modelling can come from anywhere, because it's the forms that matter most. So let's begin.

For all the assets you need go to creativebloq.com/vault/3dw205



1 BLOCKOUT AND FIND SHAPES

I start by blocking out the forms simply by bashing all the different primitives together. Scaling them up and down, bending and using FFD modifiers from 3ds Max. There's no need to worry about anything else other than the overall silhouette. To balance the whole object, keep checking the measurements and sizes of different parts. Use different perspectives and views to see through the mess of blocks and begin to develop a vision for your final image.



2 BEGIN MODELLING

I start this model in a very uncommon way: by completely modelling the left leg first and ignoring everything else. This is because it is the most detailed and complex part of the whole model. Part by part, starting from the groin, I work down to the foot. When modelling mechs you need to think on a deeper level; don't view it as flat pieces of armour and consider the mechanical parts behind the plates, like the hydraulics, cables and sensitive parts the armour hides.

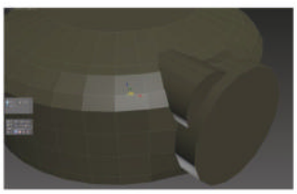
TOPICS COVERED
- Modelling
- Materials
- Rendering
- Compositing



TANK-INSPIRED MECH
Maschinen Krieger models heavily influenced Tomi's mech creation

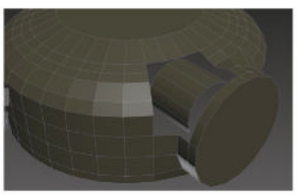
START SIMPLY

MODELLING COMPLEX FORMS



ONE BLOCK OUT PRIMITIVES

Intersect the forms you want together and make sure that loops match as closely as possible, and there's enough geometry to maintain.



TWO ATTACH AND EDIT

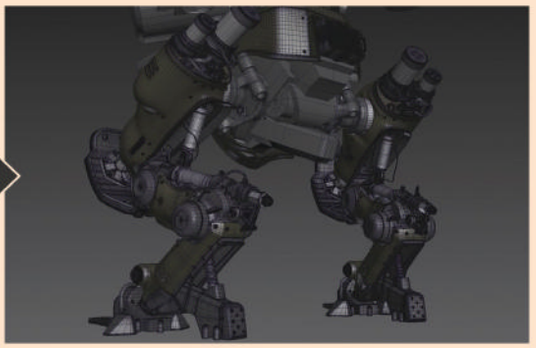
Attach geometry and delete unwanted edges. Get the edge flow to match the main form. I keep small gaps between geometries to help bridging and welding.



THREE BRIDGE AND CLEAN

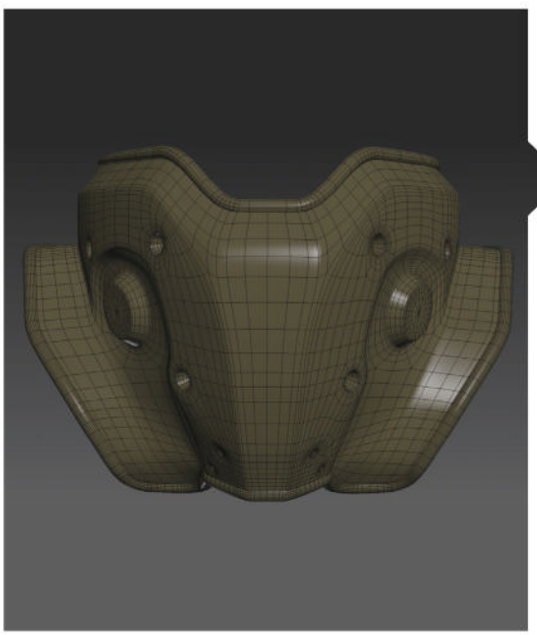
Bridge geometry together and make support loops. You may need to move vertexes by hand. Keep constraints on for faces. Check geometry works with subdivions.

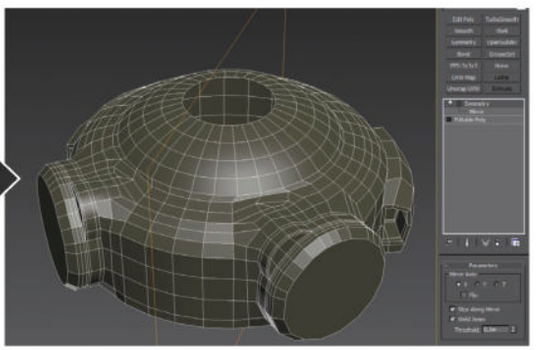




3 USE A SKELETON

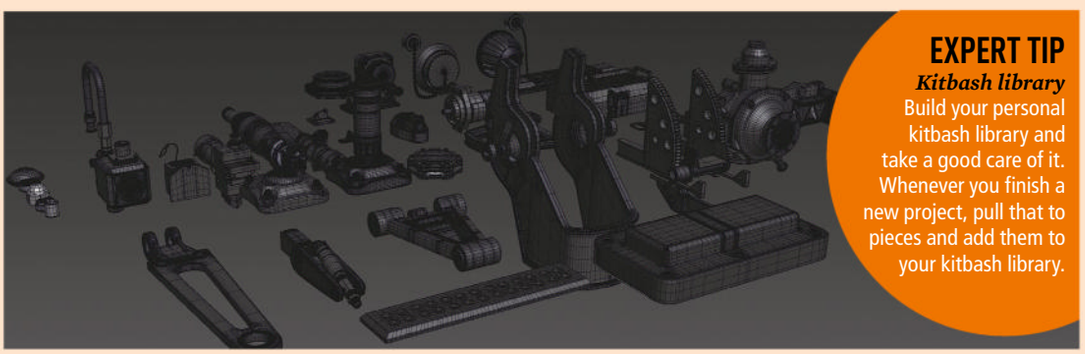
The hydraulics act as a skeletal structure that I build around. I start with the primitive that represents the closest form I'm after. Then I use the Edit Poly modifier and refine the shape. I use the Extrude, Cut, Weld, and Swift Loop tools to create the forms. On the modifier side of things, Symmetry, Shell, FFDs and TurboSmooth are the most common tools. Normally I stay with standard poly-modelling and rarely use booleans as they tend to break up the geometry.





4 MODELLING BIG PARTS

Being a symmetrical form, you only need to model one half of the mech. I use the blockout model as a base for this main model. Some areas require more work by moving vertexes by hand (using constrains and snaps), but mostly I use the quad geometry. It's also important to use enough geometry to get the forms as you like, but still keeping it manageable. Occasionally I use the TurboSmooth modifier to clean up the geometry before continuing with the Edit Poly modifier.



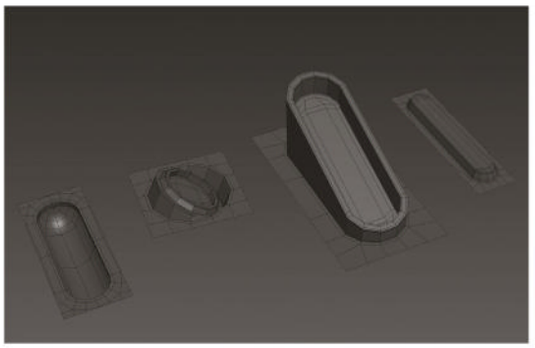
EXPERT TIP

Kitbash library

Build your personal kitbash library and take a good care of it. Whenever you finish a new project, pull that to pieces and add them to your kitbash library.

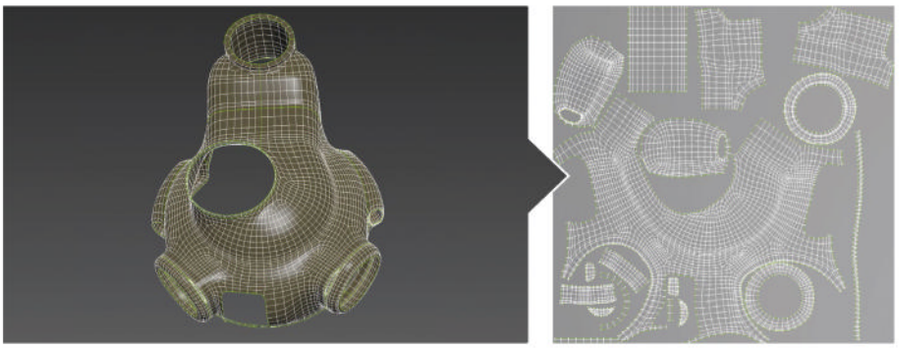
5 MODELLING DETAILS

By looking at my reference images, I have a clear idea of what kind of detail the model needs. I could easily spend a day or two just modelling these different assets. They will also make a nice addition to your personal kitbash library. I'd recommend modelling every individual part in high detail because you may need it later – either on this project or another mech model. Always think of these assets as a set, too. For example, model more than you need; three bolts instead of one just for the case of variation. These details can be done in the same work file but on a different layer. Besides having a large kitbash library for yourself, it's also really useful to have these pre-made forms – such as difficult bevels or cylindrical forms at weird angles – in a planar surface. These can then be easily added as part of your mesh or become a starting point for a new mesh. Small workflow patterns like this can save a lot of time in the long run.



6 KITBASH LIBRARY

The mech is covered with all sorts of details, like nuts, bolts, handles and plating. This is where having your own kitbash library helps – it just doesn't make any sense to model the same screws and handles again and again. By looking at my references, I analyse the distribution of detail. What are the areas with lots of it and where to not put any. I use the Select and Place tool in 3ds Max to add the bolts across the surface.

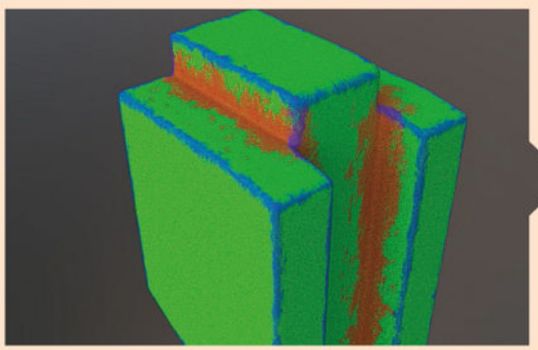


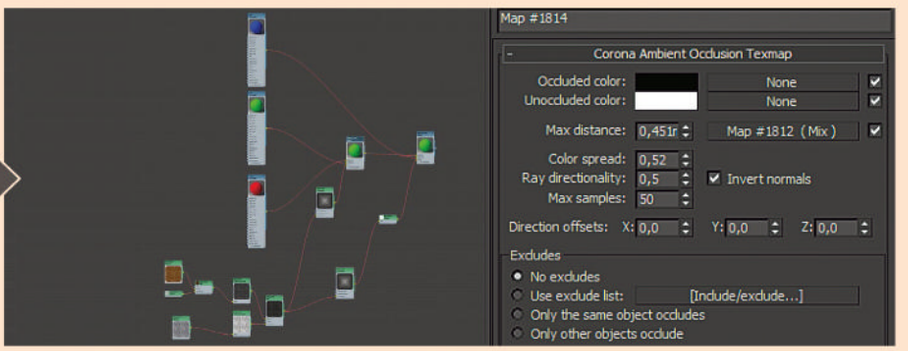
7 UVW MAPPING

Most of the time I simply use standard box, planar and cylindrical mapping with procedural and tileable textures. There's usually no need to unwrap every piece and even the larger forms can sometimes be cheated to look good without unwrapping anything. For speed I sometimes just fix those large seams at the compositing phase. The only elements I unwrap in this model are the main hull base and all of the hoses. The hull is textured using Mudbox and Photoshop.

USE KITBASH SPARINGLY

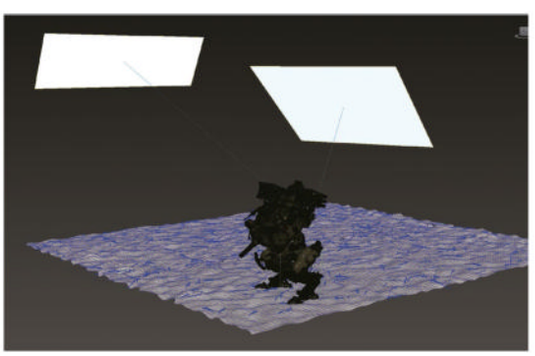
I find it important to not 'model' everything by kitbashing because it will make all your models look too similar and messy

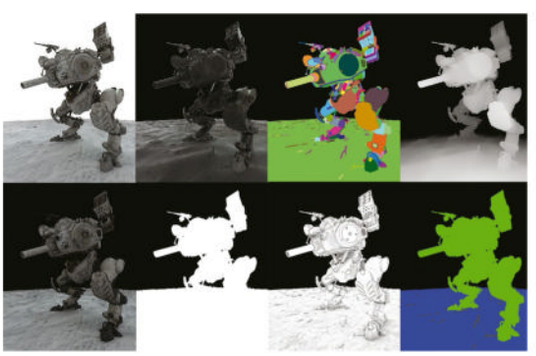




8 USING SHADERS

For shading and rendering I use Corona Renderer. Corona is really responsive, modular and shading with it is fast and fun. I have this self-made base shader that I use for everything. The base idea for the shader is to automatically generate rust and worn edges by using ambient occlusion as a mask. A base material is whatever you want it to be, in this case it's a painted metal surface. The rust shader is simply heavily bump mapped with worn edges and has a really glossy, almost mirrored surface shader. To get these nice grungy and uneven edges between occluded and unoccluded colour, I break it up by using a high contrast and tileable black and white bitmap, so this acts as a base. All the different materials in this scene started by using these same base shaders. I add this to my material library and will load it in when needed, just like all the other good looking materials for this project.





9 LIGHTING THE SCENE

The mech is being placed in an overcast environment and there's a snowstorm going on, so I want to keep the lighting very simple. The majority of the light is coming from the HDRI map, but there's also a subtle blue backlight and small fill light in the scene to make those forms pop out more. Also, the ground is covered with white snow, which will act as a big reflective surface to give me a lot of bounced light from below and liven up the shot.

10 SETTING UP RENDER PASSES

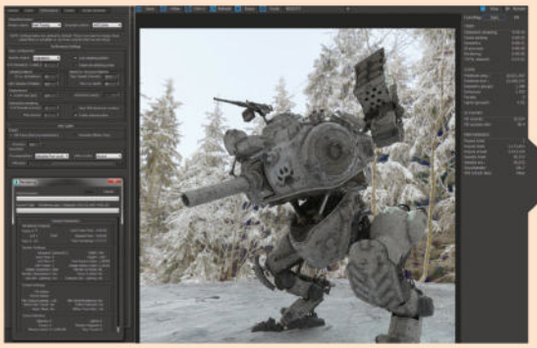
To make things easier to composite, it's necessary to have really good masks. Usually these masks are easily achieved by having different object IDs and Wire Color render passes but here I also use a few extra passes, such as ambient occlusion, faked fresnel reflections and wireframe. If fake fresnel sounds scary, it's just a standard falloff map that gives highlights to an object's edges. I find this useful to use when refining forms.

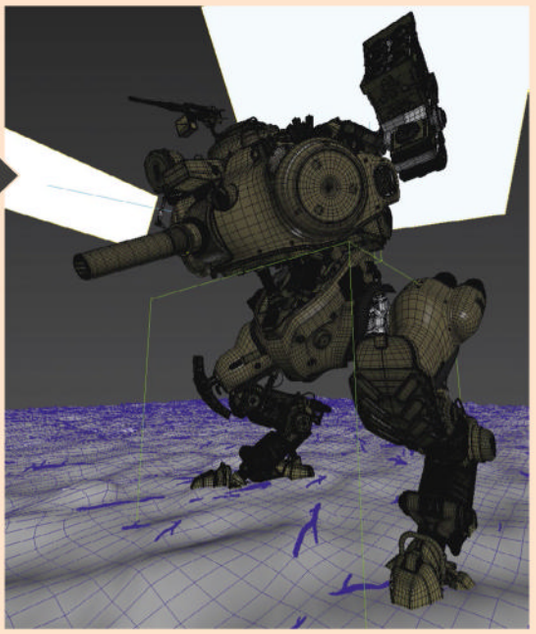
EXPERT TIP

Take a break

I cannot stress this enough. Take a break now and then and do something else. You'll spot the mistakes in the model you have made so far, and it also helps to keep you motivated.

Rendering in Corona is straightforward. You can get good results with the preset settings without optimising everything





11 START RENDERING

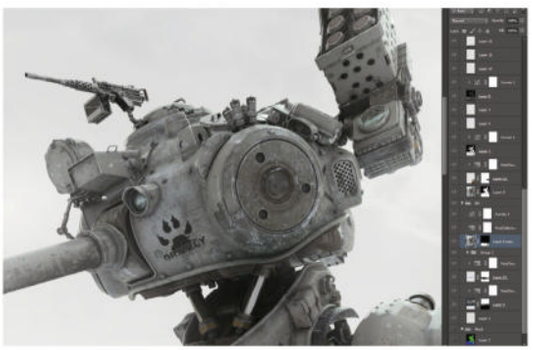
Rendering in Corona is straightforward. You can get good results with the preset settings without optimising everything. But in complex scenes with a lot of bounce light you may want to adjust the Max Sample intensity and Max Ray Depth sliders. I don't like to render camera depth of field because it can be hard to adjust afterwards – and that's why we have passes. For faster results use progressive rendering limits, using the Rendering Pass limit or Time limit.

EXPERT TIP
Tileable textures
Have a wide selection of tileable high contrast black and white textures to use as masks for different materials.



12 BEGIN TO COMPOSITE

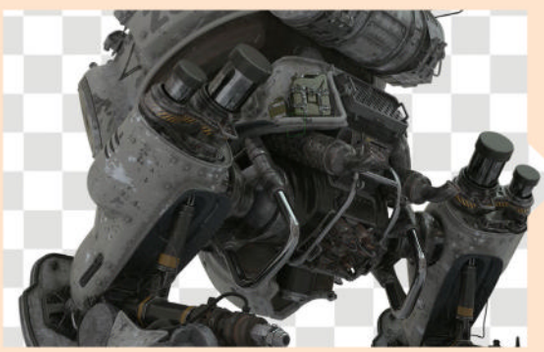
Even though I rendered all the passes, I only use a couple of them for these images. First of all I load in my standard beauty pass, masks and alphas. I make correctly named folders for them to make things easier to navigate. Next I separate foreground, background and the mech model. I'd advice you to experiment at this stage and try all the passes with different blend modes, because trial and error can lead to some amazing 'happy accidents'.



13 THE OVERPAINTING PROCESS

When working with still images, I like to overpaint a lot. I first look at the UVW seams and fix them (boxmapping can sometimes leave little scars). When painting with standard brushes it's tempting to add worn and teared edges everywhere, but go sparingly. At this stage I blend in photo textures using Overlay and Softlight blend modes. Be careful at this stage; good use of textures can make your rendered materials really pop but overdo it and it can ruin your work.

PERFECTING YOUR WORK
Continue to tinker with your mech. Make sure you don't have overly black or white spots that can ruin the balance





14 FINISHING TOUCHES

In the end, all that is left is the final colour correction. I apply Copy and Merge to the whole image and add depth by using a ZDepth pass. Even at this stage I'm still tinkering with the mood by experimenting with different colour variations using gradients and blend modes. Finally, using Levels and Curves, I ensure the final image has equal blacks and whites, so there's no overly dark or white spots ruining the balance. ■

3D WORLD PRO



YOU ARE INVITED TO JOIN

3D WORLD PRO

PRO BUNDLE WORTH £371

From students to Oscar-winners, CG artists and animators from all over the world rate our magazine, so we've taken it one step further to offer you **3D World Pro**.

Join **3D World Pro** and as a special introductory offer, you can **save £30!**

WHAT YOU'LL GET

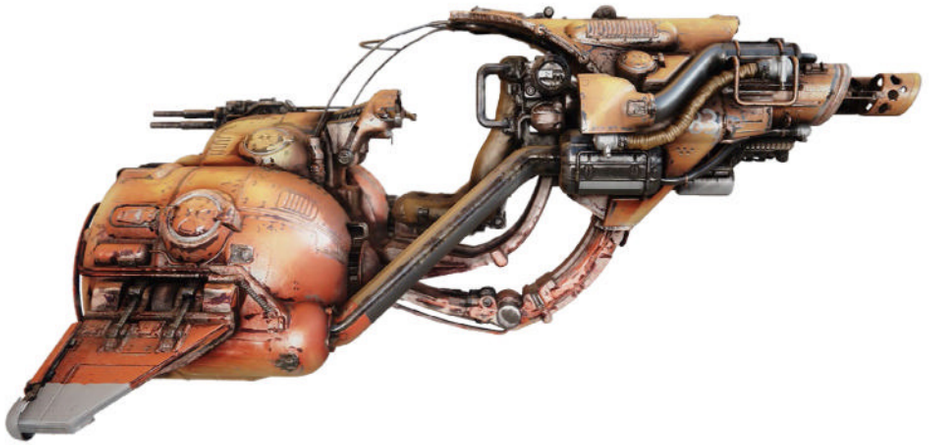
- 13 issues of 3D World in print and digital
- Annual Industry Report worth £100
- A design handbook worth £9.99
- Discounts to industry events including FMX and VFX Festival
- Special discounts from selected partners (including LightWave and iClone)
- Monthly 3D World Pro email newsletter

ALL THIS FROM JUST ~~£135~~ £105

JOIN TODAY VISIT...

www.myfavouritemagazines.co.uk/3dworldpro

TERMS AND CONDITIONS Pricing and savings quoted are compared to buying full priced UK print and digital issues. You'll receive 13 issues in a year. Prices correct at point of print and subject to change. Full terms and conditions myfavm_ag/magterms. Offer ends 31st March 2016.



QUIXEL SUITE 2 | PHOTOSHOP

GET STARTED IN QUIXEL SUITE 2

FOLLOW THE VIDEO
If you see the Play icon, use the link!

Wiktor Öhman shares his tips to master the tools to quickly improve your normal maps and texture detail, with the new industry standard Quixel Suite 2



ARTIST PROFILE
Wiktor Öhman
Wiktor is an art lead at Quixel and has a background in video game art with studios such as Star Vault and Ubisoft Massive.
www.artbywiktor.com

Quixel Suite 2 is the latest version of the industry leading texture painting suite that comprises three main applications, NDO (for creating normals), DDO (a real-time texture painting tool) and 3DO (a physically-based renderer). While the suite offers many easy-to-use features, in this tutorial I aim to introduce you to the core workflow to get up and running in the suite of apps. But firstly, let's look a little closer at those tools…

NDO allows you to use any tool in Photoshop to create non-destructive normals, including shapes, paths, strokes, selections and photographs. It uses all the tools to create normals quickly, including tiled designs, converting photos to rich normals, and quickly adding details to existing normal maps. My tips cover detailing an existing normal map and mesh.

DDO is a PBR texture painting tool used inside Photoshop to create highly detailed textures very quickly. It's been developed for artists by artists, so it's a really intuitive tool designed to make texturing easier.

Once your texture work is complete you can create a presentation render of the model in 3DO, a powerful physically-based renderer inside Quixel Suite 2.0. It comes with various camera post-processes designed for presenting your model.

For all the assets you need go to creativebloq.com/vault/3dw205

EXPERT TIP
Check progress
Press [Shift]+[Space] regularly to refresh your normals and show your new texture work in an instant.



1 SET UP A PROJECT

NDO enables you to specify the mesh, as well as the Baked Normal, to see the changes made in real time in the 3DO previewer that ships with the SUITE. Start by selecting Launch NDO Project Creator>Mesh>Baked Normal and select your .obj file. Once imported, select Create New Project. To add a new detail to an existing normal map couldn't be easier. I choose to add a vent to the engine section of my speeder.

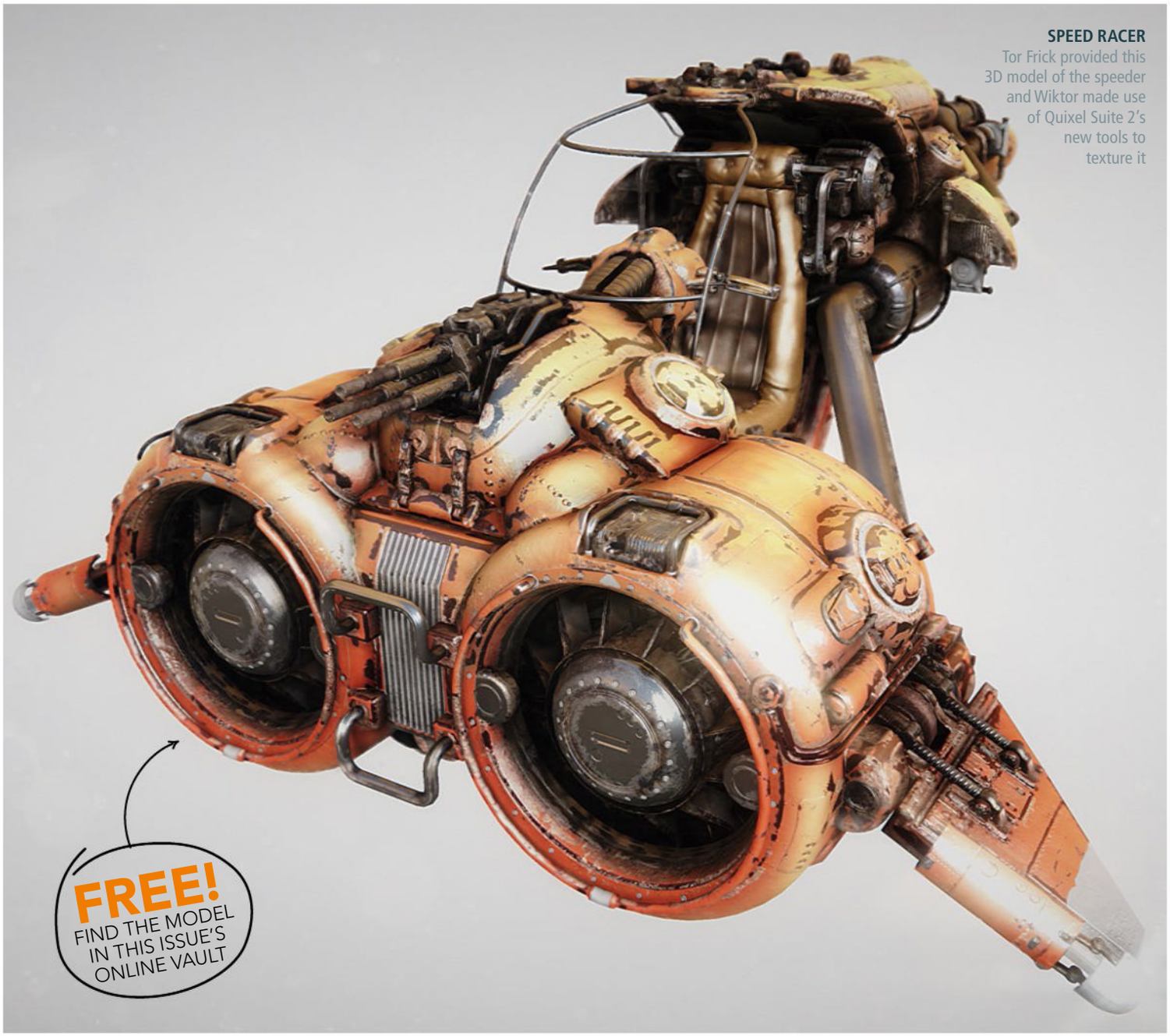




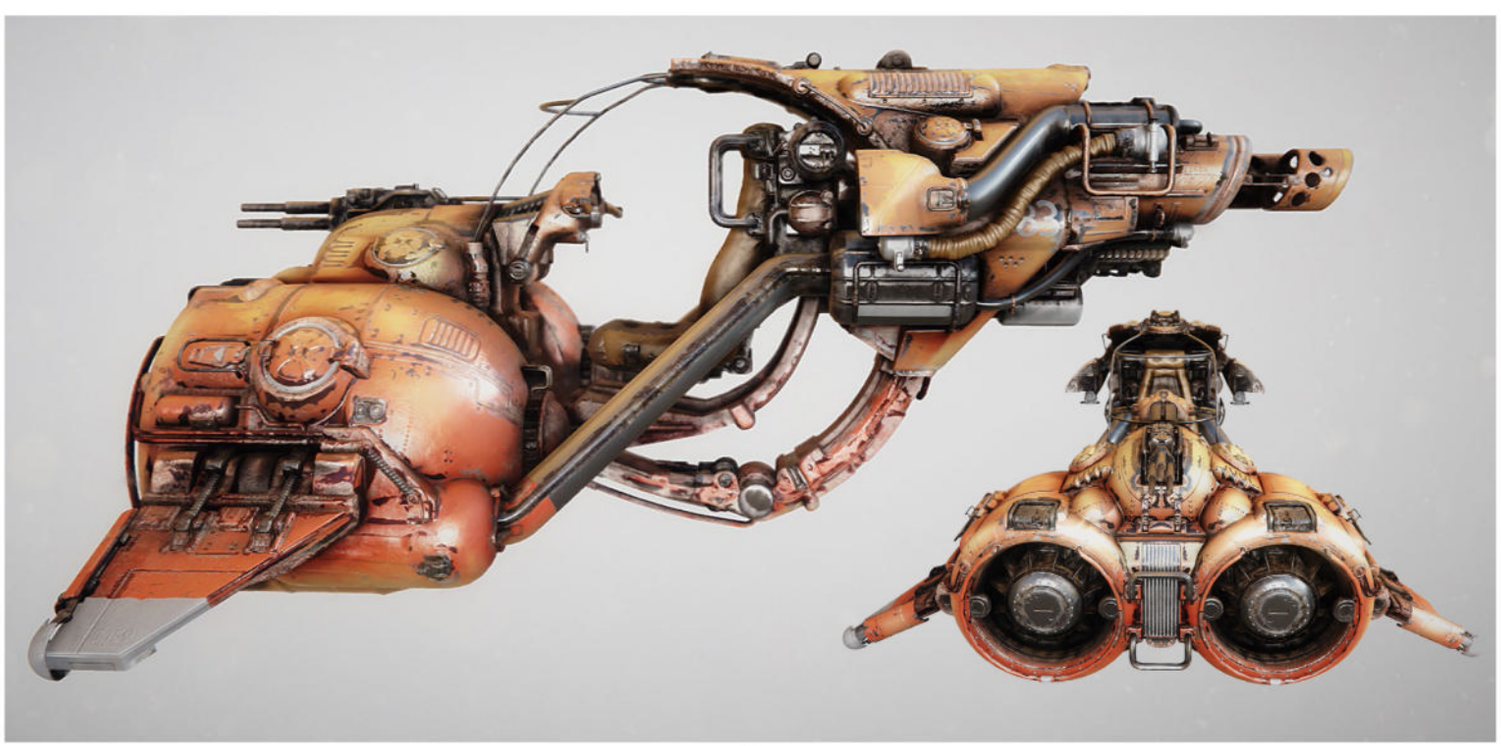
2 USE EXISTING NORMAL MAPS

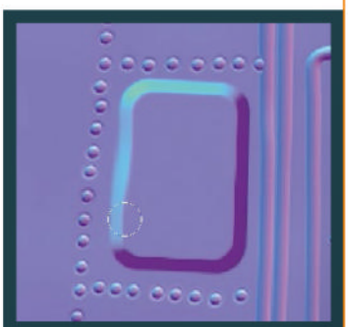
I begin by selecting the Shape tool and set it to a rounded rectangle; this is the base shape of the vent. I close down the 3DO previewer to see the normal map. Next I create a New Sculpt layer and the rectangle Shape is created into a normal automatically. All I need to do now to get the normal detail, and create my vent panel, is to drag out the shape and rotate to fit existing details.

TOPICS COVERED
- Edit normals
- Add details
- Paint textures
- Customise materials
- Quick render



SPEED RACER
Tor Frick provided this 3D model of the speeder and Wiktor made use of Quixel Suite 2's new tools to texture it



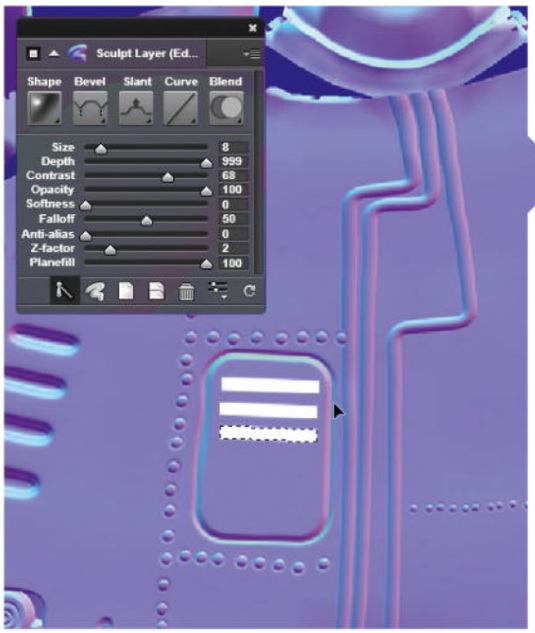


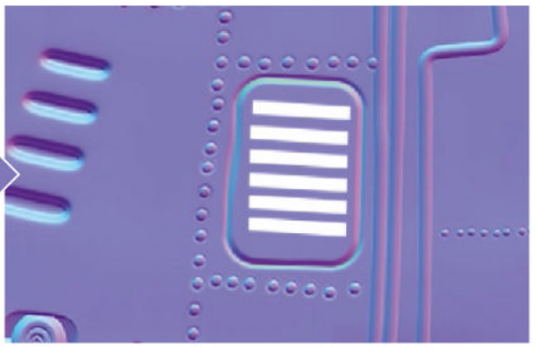
USEFUL TOOLS
Smudge and Bevel

I like to adjust with the Smudge tool. once the shape is set, to make it match your existing baked normals, select the Smudge tool to skew the edges slightly. Also, use detail with the Bevel tool. To tidy your new normal, use the Bevel tool and set it to Groove to narrow the indent and fit the existing baked normals.

SPEED UP YOUR PROCESS
Use the Zip feature

Once you've set your new normal into an existing baked normal, select the Zip button at the bottom of the In Sculpt Mode panel to zip it up. This saves space and improves performance (it's non-destructive and can be unzipped at any time).

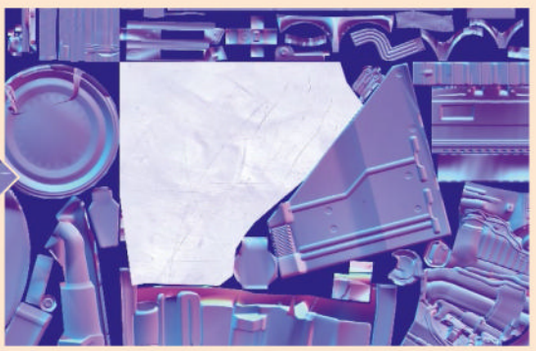




3 QUICK DETAIL

To create venting holes on top of my vent panel, I select the Marquee tool and create a panel by dragging on the normal. I duplicate this panel by selecting and [Alt]-dragging, then rotating to fit. To convert these new panels, simply hover your mouse over the NDO UI panel to see it change to the Layer panel, then select the option to convert the active layer to a normal. Next, I select Slant>Down to make the vents look like holes, then smooth the vents by adjusting Size and Softness.

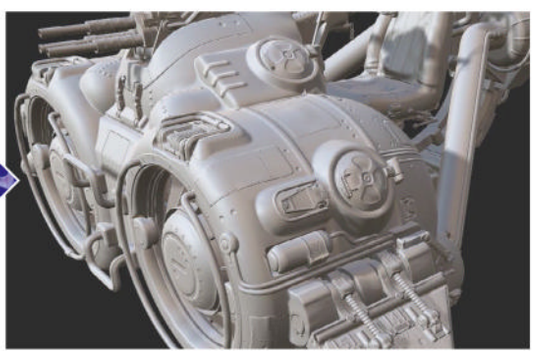




4 CREATE SURFACE DETAILS

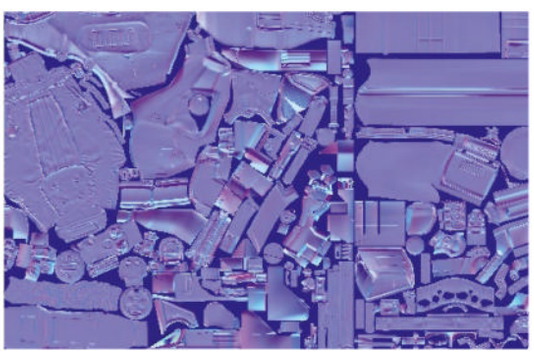
Begin by copy and pasting a photo into your normal layer and place it roughly over the area you want to detail – in this case the wing of the model. To see where the underlying details are, reduce the opacity of the photo. Use the Polygonal Lasso tool to make your selections, then Invert and Erase. Push the Opacity slider back to 100 per cent. Once done, click the Convert button to turn the photo to a normal. Again, it uses the same underlying settings.





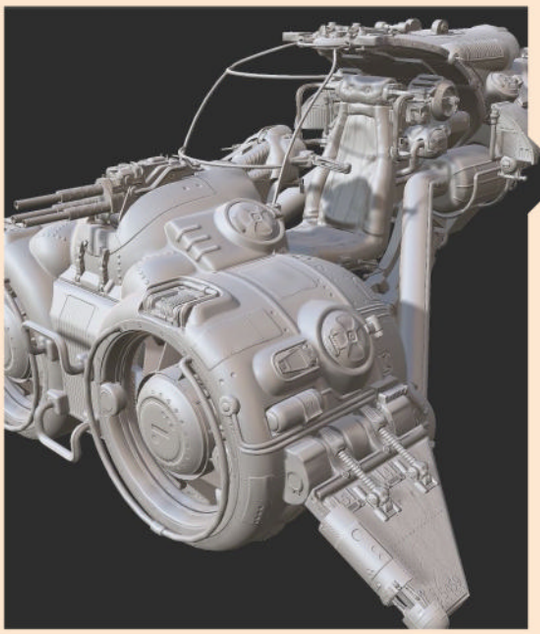
5 BLENDING SURFACE DETAIL

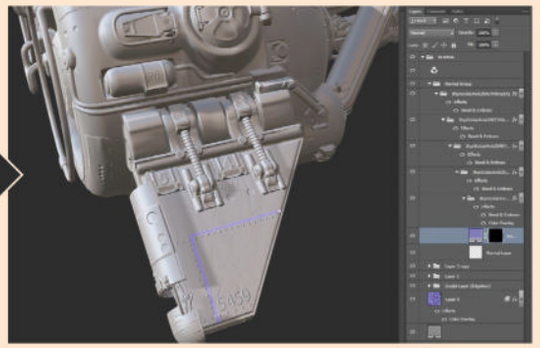
Use the slider settings in the NDO UI panel to tweak your photo normal. I adjust the Size and Falloff sliders to make the photo detail more subtle, and then go to Blend>Overlay to enable the underlying shapes to come through. Next I reduce Opacity to 50 per cent. Enter 3DO Previewer and press Refresh to preview and Zip to keep things tidy.



6 MULTI-NORMALS

Multi-normals is a new feature that enables you to quickly add lots of details, with different parameters, so you don't need to go back and forth between normal groups. You can use different Photoshop layer types in combination with multi-normals, such as using the Brush and Pencil tools to hand-paint normals or the Shape and Pen vector tools. You can also use the Text tools to convert text to normals instantly, enabling you to change font and size with ease.





7 USING NDO PAINTER MODE

Multi-normals also enables you to enter 3D painting, allowing you to paint and sculpt normals directly onto your model or mesh. Simply click the NDO Paint mode tab in the NDO UI panel to open a new Painting tab. Using a simple Hard Round brush, and holding [B] and right-clicking to change the dimensions, I paint in a panel detail. Just like in Photoshop, hold [Shift] to get straight strokes with the brush.

EXPERT TIP

Preview the normal

Press [Shift]+[Space] to preview your painted normal. To preview without the mask overlay, press and hold [N].





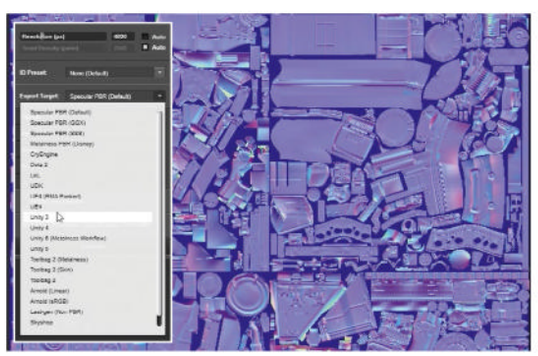
8 MULTI-NORMAL LAYERS

Click the new layer icon and in the same normal as before we can start adding text; simply click the Text tool and begin typing. The words are automatically converted into a normal. You can change text, rotate and resize at any time as it's non-destructive. Next, on the same normal layer, I click the Shape tool and add a vector shape under the hinges. Open 3DO and refresh to preview the changes.



9 SETTING UP IN DDO

Launch DDO Painter and open the Base Creator, this is where you can set up your project by hooking up your mesh and map inputs. Using the Quick-Load inputs option hooks-up inputs automatically – providing they follow the same naming convention. I tick the Bake in 3DO options on the Object Space Normal, Curvature and Position Gradient tabs. Next I set the resolution to 4K (you can upscale at any time, 3DO also supports 8K).

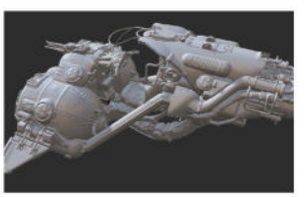


10 EXPORT TARGET

You can export to any number of pre-defined apps, for example if exporting to Unreal Engine simply click the UE4 tab under the Export Target drop-down menu. This means your texture and shader setups follow the same standard as Unreal, for example using AlbedoM, Metalness, Roughness and Normal. Finally, all you need to do is click Create to continue.

SHORTCUTS

FRESHEN UP YOUR WORKFLOW QUICK WAYS TO WORK BETTER



ONE EDITING LAYERS

A simple trick to go back and edit a layer in your normal is to enter Sculpt mode – second button on the left in the NDO UI panel. You can enter Sculpt mode at any time.



TWO WORK ON SMALL DETAILS

Use the Brush tool in Photoshop to add small details to an existing normal map. If working on an existing normal it will use the same layer settings for speed.



THREE USING SCULPT LAYERS

Remember, anything added to a Sculpt layer is instantly converted to a normal. When you exit Sculpt mode, it automatically zips your file to reduce file size.





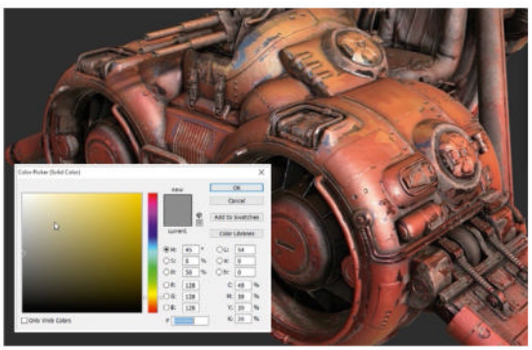
11 BUILD MATERIAL DEFINITION

DDO works with a large amount of physically-based scans and smart materials – multi-layered textures with dynamic weathering that react to the shape of your mesh. To add a smart material, click the Material Browser icon and search through the presets until you find something that fits your project. For my speeder, I choose Metal>Scratched Painted Metal for a worn looking material, and click Create to apply.

EXPERT TIP

Stroke preview

When hand-painting, pressing [M] will allow you to preview the strokes in a clearer way by removing the textures.





ADJUSTMENTS

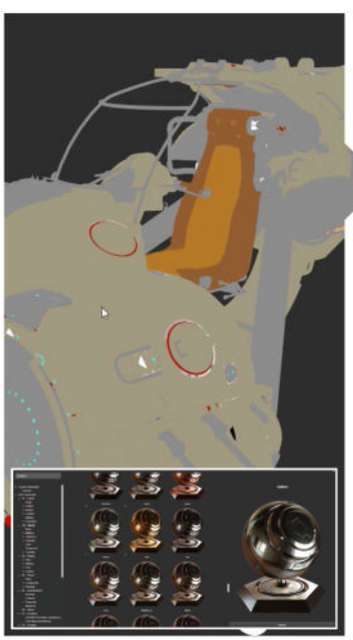
Clicking Roughness and reducing the slider by 50 per cent will make it glossier

12 CUSTOMISE YOUR MATERIAL

For a sun-bleached effect click DDO>AlbedoM>Add Clean Layer (on the bottom bar). Hold [Ctrl] and click Add Clean Layer sets the Blending mode to Overlay. Click the colour swatch to open the Color Picker panel and make it slightly yellow. Enter Dynamask mode by clicking on the left panel in the Color Overlay tab to begin painting in full shaded mode. Here I loaded the Sun Bleach Heavy preset and increased the Tightness slider to 70 per cent and click Accept Mask.

13 COLOUR HAND-PAINTING

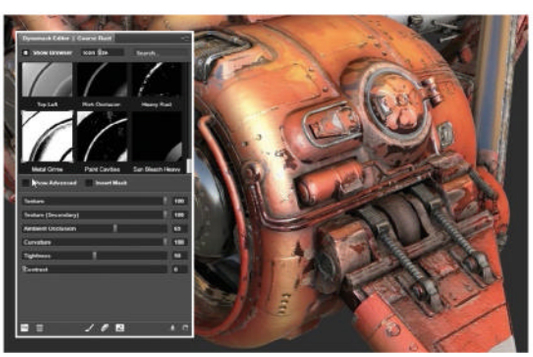
The Painter allows you to paint anything at anytime across all maps. Click Add Color Paint Layer to begin and access the colour options from the Painting panel. Here I begin painting out some colour highlights in a yellow-orange tone, on a low opacity to get a dynamic build-up of paint from my strokes. I also add some darker reds to add more depth to the crevices of the engine. Click the Paint icon on the Color Paint Layer in DDO to exit paint mode and save your custom changes.





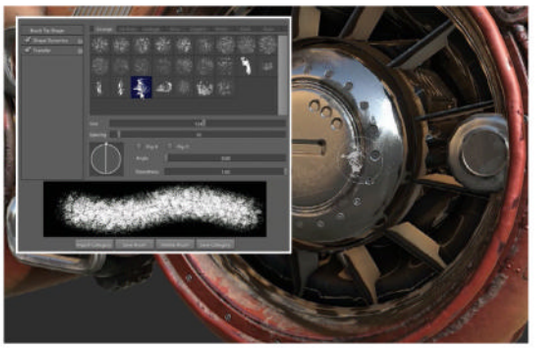
14 USING MASK ID

Holding the [C] key will instantly show the ID map. From here you can click on the area you want to work on and by holding [Shift]+[C] you will open the Material Browser. From the browser I choose to add a smart material. I select a metal material from the presets and press the Create button to add and zip the material.



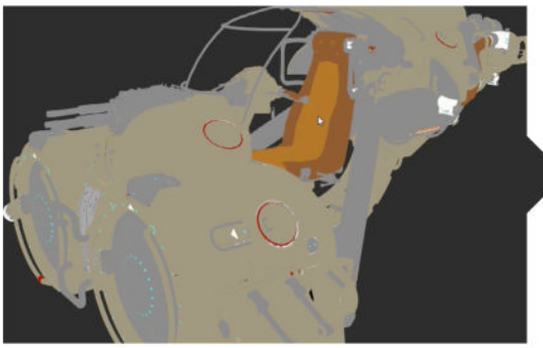
15 DESIGN THE DYNAMASK

Next I want to add grime into the crevices by loading a single surface scan. Go to Material Browser>Coarse Rust>Create. Hover over the Coarse Rust layer and click Edit Dynamask, then choose Metal Grime from the presets. Now tick the Show Advanced tab to expose and edit the advanced parameters of the mask. I start by tweaking the Tightness of the AO influence to around 70 per cent on the slider.



16 ADDING GRIME

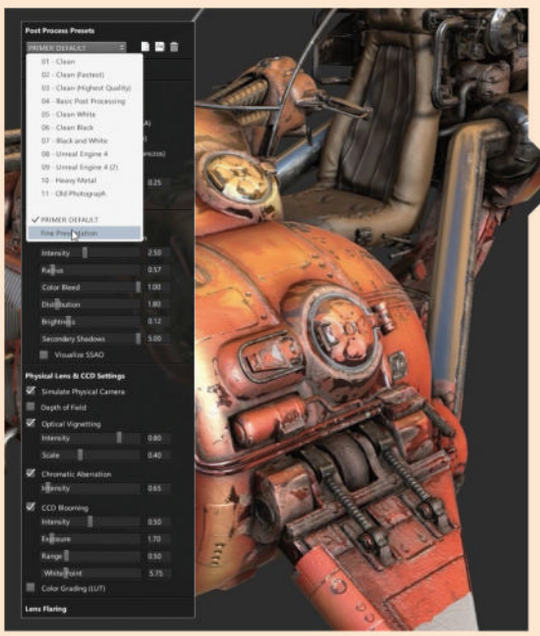
Now I want to add some grime to the front caps. This can be done by painting directly onto the mesh. I open the Grunge Brush panel from the Painting panel, then choose a preset Brush Tip Shape; Size: 124, Spacing: 10, Angle: 0.00, Roundness: 1.00. You can paint directly into the Dynamask and once done, press Accept Mask to apply.



17 ADDING LEATHER MATERIAL

Hold [Shift]+[C]-click the seats to open the Material Browser and select the Leather material preset and apply to add the leather materials to the seat model. I want to also add a leather material to the outer edge of the seat, so select the Leather group and hold [C]+[Ctrl] to add another ID. I want a material separation between the two while still keeping the material type, so I add a new Overlay layer, change the colour and link it to the outer area of the seat.







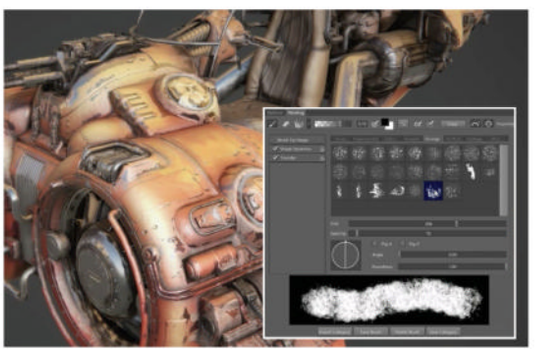
18 SET UP YOUR RENDER

Open the Options menu and tick Post Process to see the default 3DO Post Process presets. You can then adjust the settings to suit, these include Intensity, Color Bleed and Brightness. 3DO also comes with preset defaults for different uses. For example, under Post Process presets I click the drop-down menu and set it to Fine Presentation. I like to increase the size of the 3DO viewer to get a better look by click-dragging on the bottom right corner of the viewer.

EXPERT TIP

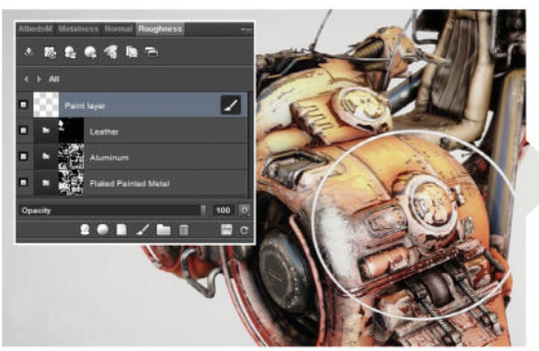
Tweak materials

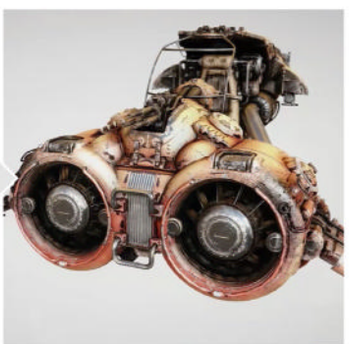
You can always tweak materials non-destructively as you paint by adjusting the Opacity, Texture Intensity and Scale.



19 TWEAK THE RENDER

I like my render but feel it needs some final texture details. I want to add some soot and dust around the engine, directly to the final render. To do this, click the Color Paint layer (small brush icon in the DDO panel) and click on Paint Layer>Painting>Brushes>Grunge. I choose a brush with some directionality and, keeping the opacity low, I paint on the soot directed away from the engine.





20 ADDING ROUGHNESS

Finally, I want to enhance my painted soot strokes, so I click Roughness in the DDO panel, select a Leakage brush, rotate and resize, and then paint over my soot strokes. I toggle Color Paint mode off and take a look at the new render in full screen mode. ■



ARNOLD FOR MAYA PLUG-IN

STILL LIFE PART 4: TEXTURE MAPS

In the final part of his render series, ***Bhaumik Patel*** shows how to create and apply texture maps to the still life scene

FOLLOW THE VIDEO

If you see the Play icon, use the link!



ARTIST PROFILE
Bhaumik Patel
Former Escape Studios tutor Bhaumik has created Amaya Academy, which offers a 30+ hour online course in Maya for visual effects and animation to get you from beginner to professional level.
amayaacademy.com
AMAYA ACADEMY

TOPICS COVERED
- Cloth and wood textures
- Reflections
- Texture maps

In the last part of our series on rendering in Arnold for Maya, we will finish off our scene by applying texture maps to the remaining objects. Texture maps are highly optimised inside Arnold.

When you press render, Arnold performs some operations on your textures. It automatically creates smaller versions (these are known as mipmapping), and tiles them for better memory efficient access.

This allows Arnold to deal with massive scenes efficiently and allows it to anti-alias the scene quicker. With larger textures this will appear to be a slight delay before rendering.

You can save this step by turning off those features. Go to Render Settings> Arnold Renderer>Textures section, and then turn off Auto Tile and Auto Mipmap.

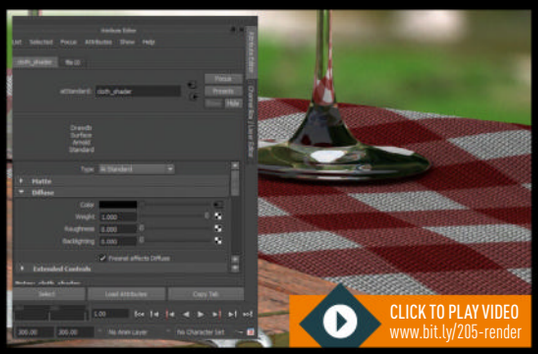
For larger scenes it's best to use these features and you can pre-calculate your textures and save them as .tx files. You can do this easily using Arnold>TX Manager. TX Manager will find all the textures in your scene and can select the ones you wish to convert and click the Create .tx button.

However, be sure to turn on Use Existing .tx Textures in the Render Settings> Arnold Renderer>Textures section after you have created your textures.

We will be making wood, metal and cloth. Cloth is a diffuse material and has a slight highlight on the edge. Wood is generally treated so it has a shine with plenty of breakup in the highlight where the grain is. Metal is very reflective and can be a sharp reflection such as chrome or blurry. Like a brushed chrome, because it's reflective its diffuse colour will be very dark.

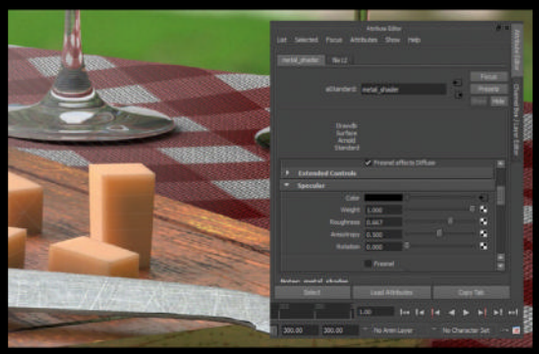
> When you press render, Arnold performs some operations on your textures. It automatically creates smaller versions and tiles them for better memory efficient access

For all the assets you need go to creativeblog.com/vault/205



1 TABLE CLOTH TEXTURE

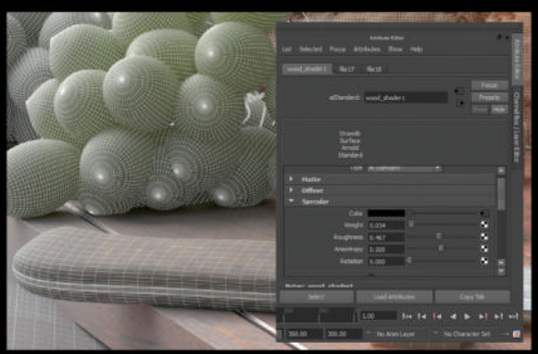
So first, select the cloth object, right-click and select Assign New Material. Create aiStandard from the Arnold section and rename it cloth_shader. Let's map the diffuse colour by clicking on the checker, pick file. In the file node click on the folder icon and pick cloth_color.tif (download from the online Vault). Do the same for the bump map and pick cloth_bump.tif. Set the Bump Depth to around 3 and increase the diffuse weight to 1.



2 METAL REFLECTIONS

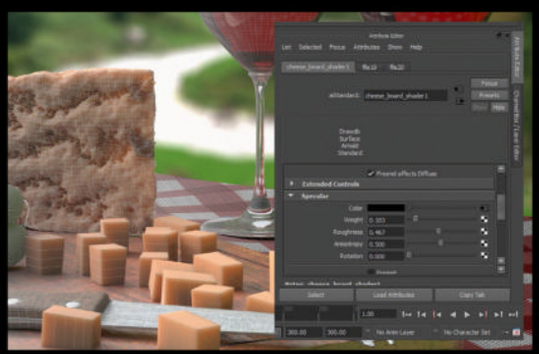
Begin by selecting the faces for the knife's blade and assign a new aiStandard shader, rename it metal_shader. Let's set our Diffuse Weight to around 0.06 and Diffuse Colour to a dark grey. Set Reflection Weight to 1 and map reflection colour with knife_metal_specular.tif (download from the online Vault). This will make the reflections bright but we don't want them to take over the image, so let's diffuse them by setting Reflection Roughness to around 0.65.

CREATE A USED LOOK
Be sure to increase the roughness value to blur the reflections, giving a more used and less CGI look



3 CREATE THE WOOD HANDLE

The knife isn't all metal, so we need to make the handle a wooded texture. Start by selecting the faces for the knife handle and assign another aiStandard shader. Rename this wood_shader. Now, map the diffuse colour with knife_wood_color.tif (download from the Vault). Add some highlights to the wood, set the Reflection Weight to 0.034 and map the reflection colour with knife_wood_specular. You can increase the Reflection Weight to make it look less weathered.

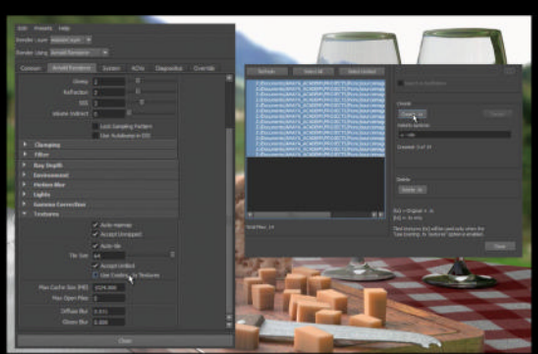


4 CHEESE BOARD

Open the hypershade and duplicate your wood shader using the Edit>Duplicate command. Rename it cheese_board_shader and assign it to the cheese_board object by middle mouse button dragging and dropping onto the object. Replace the diffuse colour file with cheese_board_color.tif (and specular colour with cheese_board_specular.tif). Both files can be download from the online Vault. Finally, tweak the settings by increasing the Reflection Weight to 0.2.

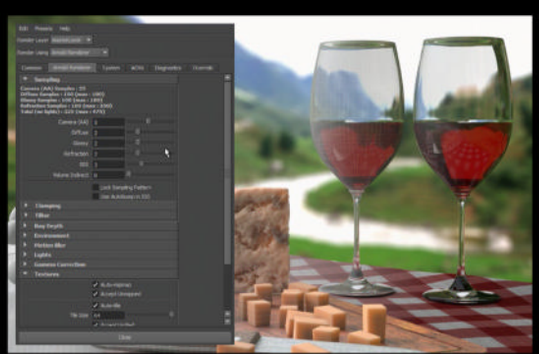
IMPORT TEXTURES
Keep it simple

A nice way of importing textures is to simply drag them from your explorer or finder window into the Hypershade. This will create a file node for all the textures and name them the same as the file name. You can then use the TX Manager to create your .tx files before you start. The textures will be located in the same folder.



5 TURN ON TEXTURES

Now that we have set up our shader with texture maps let's create our optimised .tx files. Start by opening Arnold>Utilities>TX Manager and you will see a list of the textures in your scene. Click the Select All button and click the Create .tx button. We need to tell Arnold to use these textures, so in the Render Settings go to the Arnold Renderer>Textures section, and turn on the Use Existing .tx Textures check box.



6 FINAL ADJUSTMENTS

Let's remove the grain by increasing the samples on our area light to 5. In Render Settings>Arnold Renderer>Sampling, increase your AA samples to 5. Have a look at the render and if there is grain in specific areas, such as SSS, then increase the samples. Set the SSS and Diffuse samples to 3. You can increase AA samples further to reduce grain. ■

WATCH YOUR SAMPLES
Be sure to increase AA samples sparingly as this will increase the overall render time exponentially



3DS MAX | V-RAY | GROWFX | FOREST PACK

CREATE VEGETATION FOR ARCH-VIZ

Ryan Groves shows how to model, texture and scatter detailed vegetation for use in architectural imagery using 3ds Max plug-ins



PLANT MODELLING
The GrowFX plug-in helps to bring a level of craft, originality and versatility to your workflow

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-1

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-2

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-3

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-4

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-5

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-6

CLICK TO PLAY VIDEO
www.bit.ly/205-veg-7



ARTIST PROFILE
Ryan Groves
Ryan is a 3D artist at The Neighbourhood, Manchester. He has a passion for detail, mood and lighting, and strives to create evocative imagery that conveys narrative and emotion.
ryangroves3d.com

TOPICS COVERED
- Modelling
- Texturing
- Painting scatter areas
- Generating ivy
- Poly-modelling techniques

Incorporating a plant modelling system such as GrowFX into your skillset can be extremely valuable. Modelling vegetation can be an arduous and difficult process that GrowFX helps to simplify with a parametric approach. Many times I suffered with my limitations in this area of modelling, should a client require a bespoke piece of vegetation I couldn't piece together from our library.

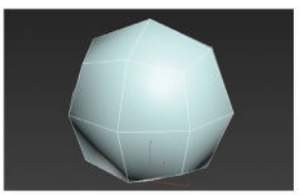
The benefits of learning a plug-in like this are huge, and it can bring an extra level of craft, originality and versatility to your workflow. I modelled the building in this scene on Refuge, in Belgium, by Wim Goes Architectuur. In this tutorial, I'll take you through my workflow for creating various elements of vegetation, from grasses and flowers to trees, using 3ds Max, V-Ray and GrowFX. We'll also utilise some traditional poly-modelling techniques to create lily pads, and take advantage of some handy tools in Forest Pack Pro to scatter our newly made models around the scenes. Covering a range of plant species should expose some of the wide array of features GrowFX offers, and provide a solid foundation to continue exploring the plug-in and create highly detailed foliage for your scenes.

To help with the understanding of the parametric modelling process I've included captioned videos to show the workflow, with added visual reference to the effects of each parameter. I've also included both the GrowFX files and collapsed meshes of all of the planting covered.

For all the assets you need go to creativebloq.com/vault/3dw205

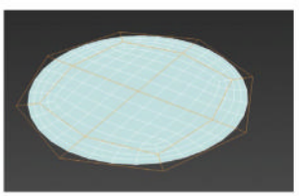
CREATE LILYPADS

POLY-MODELLING TECHNIQUES



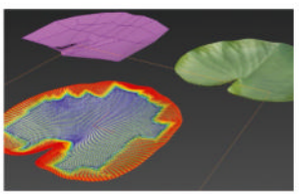
ONE START WITH A BOX

Model from reference as a guide. A good poly-modelling method to keep clean quad geometry is to start from a box, apply a TurboSmooth and Spherify modifier.



TWO VIEW ALIGN

Select the top half polygons in top view and hit View Align in the Edit Poly menu. Delete the bottom half and we have a quad mesh to work with.



THREE PUSH AND PULL VERTICES

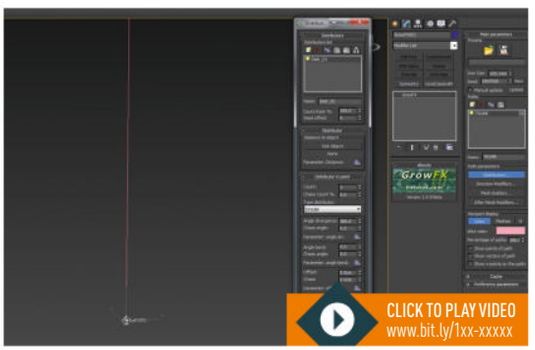
Now go with the flow, following the reference guide behind. When happy with the shape, apply Shell and TurboSmooth for thickness and a Noise modifier for more detail.





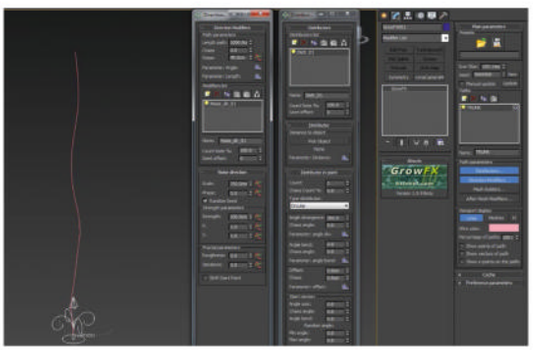
1 GATHER REFERENCES

When modelling foliage of any kind, I find it extremely valuable to gather as much reference as I can of each species I wish to create. It's important to analyse the form and detail, and break down how the plant works. Doing this will inform the modelling process and help to identify the steps in GrowFX that you may take, rather than approaching it blindly. This ensures it is a close representation of the real thing.



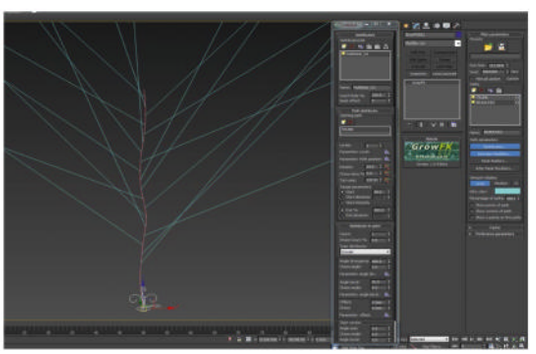
2 START THE TREE TRUNK

It's time to add a distributor. Click the Standard Primitives dropdown on the Create tab and click exlevel GrowFX. Click and drag on the viewport to create the GrowFX gizmo. Under Main Parameters in GrowFX click Create Path. Now we can click Distributors>Create Distributor in the window that opens. For a tree trunk we need the standard distributor at the top of the list. We should now have a line indicating our tree trunk in the viewport.



3 MODIFY THE TRUNK

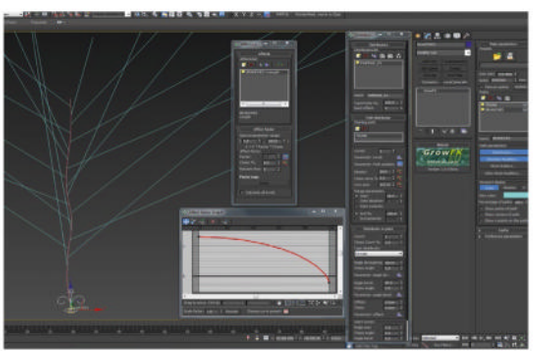
For a tree trunk, parameters in the Distributor window can be kept as default – this will come into use later for other elements. Back in the GrowFX tab, click Direction Modifiers then reduce Length to 1000cm and Steps to 40cm. On the Modifier list below, click the Create Modifer button and pick Noise Direction to add some subtle variation to the path's direction. Reduce the Noise Scale to 750cm, keeping the rest as default values.



4 ADD A BRANCHES PATH

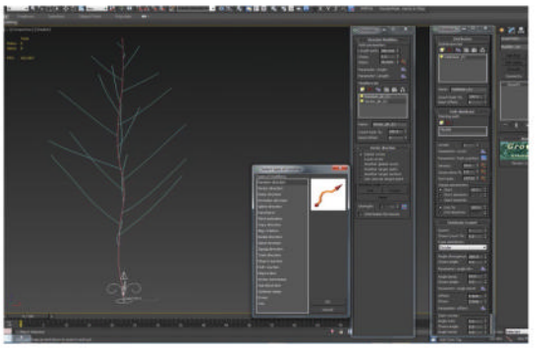
Back in the GrowFX tab, click Create Path to add another path to the model. Name this 'branches.' It's important to keep naming these layers to keep the process clear. In the Distributors menu go to Create Path>Path Distributor and pick the trunk as a starting path for the branches. Under Range Parameters set Start to 18 per cent to instruct the branches to start going 18 per cent of the way up the trunk. Set Density to 24.

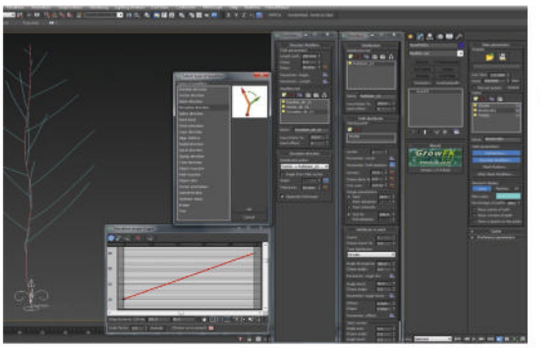
INTUITIVE MODELLING
Graphs are a useful feature in GrowFX enabling more control over how the parameters should behave



5 USING GRAPH FUNCTIONS

Click the button for Path Position then select Create Affect in the window that opens. Go to Branches>Length and click the Graph button next to Factor. Select the left-hand point of the graph and give it a value of 1.3, and the right-hand point decreasing to -0.225. Hit Choose Curve Preset and give it a curve like the screenshot to ease the effect in. This graph tells the branches to get shorter towards the top of the tree.





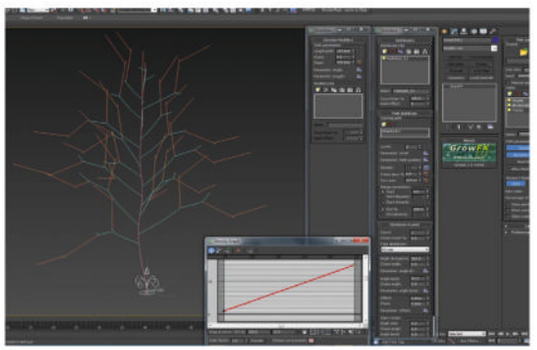
INVISIBLE EFFECT
Once the twig density is increased the effect of the Deviation modifier will become visible

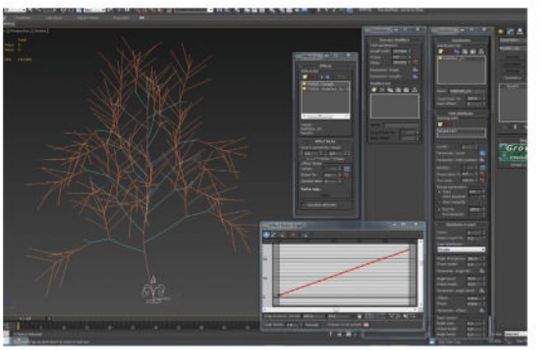
6 APPLY MODIFIERS

It's now time to modify the direction of the branches. Set the Length to 280cm and Steps to 20cm. After this, add a Random Direction modifier with Smoothing set to 100cm and a Max Angle of 10. In addition to this, some force direction with a Vector Direction modifier will add some more realism. Add a graph to the force parameter, with a straight line decreasing from a value of 80 to 36.2

7 ADD DEVIATION MODIFIERS

Deviation modifiers instruct the path to deviate/change direction once joined up with another path, for example twigs. This will add more realism to the model. Firstly in the main GrowFX tab add a new path named Twigs as we did for the trunk and branches. Then click on the Branches layer, go to Deviation modifier and add 'twigs'. Uncheck Child Vector and set Tolerance to 50cm. For angle create a straight lined graph starting at a value of 10, increasing to 40.



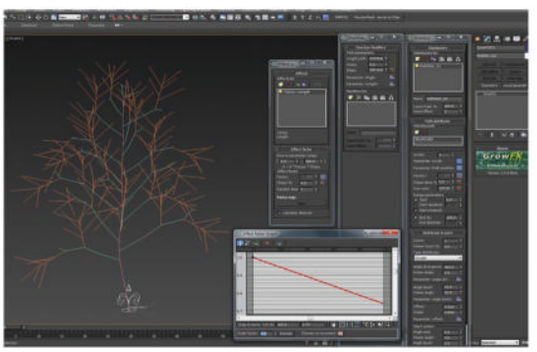


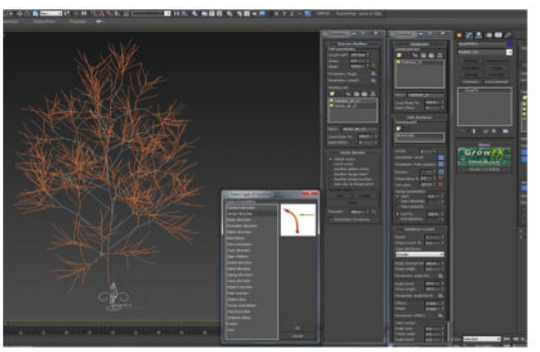
8 APPLY SHAPE WITH TWIGS

This layer is where the fullness of the tree will start to appear. On the 'twigs' path add a path distributor with branches as a starting path. Within the Distributor menu, set the Parameter Level to two to create layers of twigs increasing the reach and shape. Apply a density graph, straight lined and starting with a value of one, increasing to 15. Additional to this set Angle Bend to 52 and Chaos Angle to 10. Set Path Length to 147cm.

9 APPLY GROWTH PARAMETERS

With some more tweaks the form will start to take shape. Still in the Distributor, click the bar graph affects symbol and create an affect for TWIGS>Length, as done previously. Set the Affect factor Graph to start at a value of 1, with a straight line decreasing to 0.48. In addition, create a new affect for TWIGS>PathDist>Density, with another factor graph increasing in a straight manner from 1 to 25.



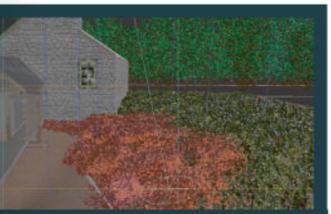


10 HEIGHT INFLUENCED LENGTH

As we did for the branches, the same graph instructing the twigs to get shorter the further along the length, needs to be applied. Within Path Position go to Create Affect>Length. Create another straight factor graph decreasing from 1 to 0.74

11 DIRECTION MODIFIERS

Adding Direction modifiers are a necessary step to increase variation and realism for organic growth. Set the Path Length to 147cm with a Steps Value of 4. Add a random direction with a Smoothing Value of 5cm, and a Vector Direction modifier with a Strength of 206. The tree is starting to get the desired look. We'll need to add another layer of shorter twigs by adding a new 'twigs02' path, back in the main GrowFX tab.

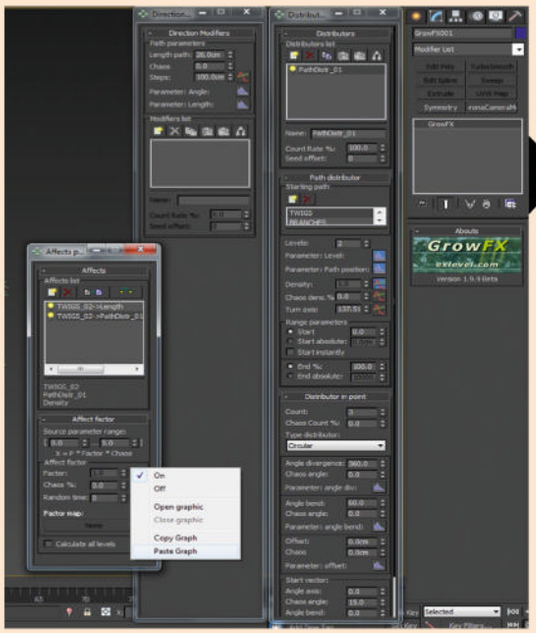


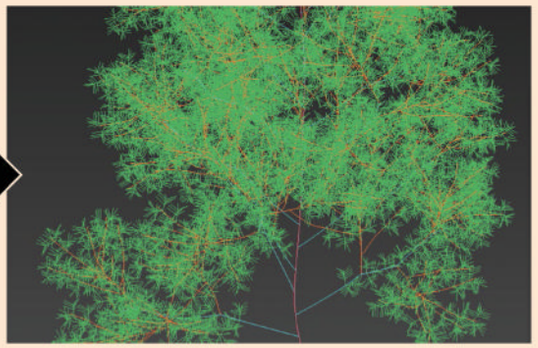
SCATTERING MODELLED GEOMETRY

Using Forest Pack to paint scatter areas

Forest Pack is a great tool for scattering geometry efficiently, with an array of density maps and transformation parameters which make it really easy to get a random look. Perfect for nature! If you need more control over the placement of your models there is also a useful paint function. Under the Areas tab, click the paint brush to add a new paint area. From here you can tweak brush size and whether you want the area you paint to be an include or exclude area for your geometry; in this instance I used include. From here you can paint directly onto your mesh in the desired area and watch your scattered geometry appear with each brush stroke.

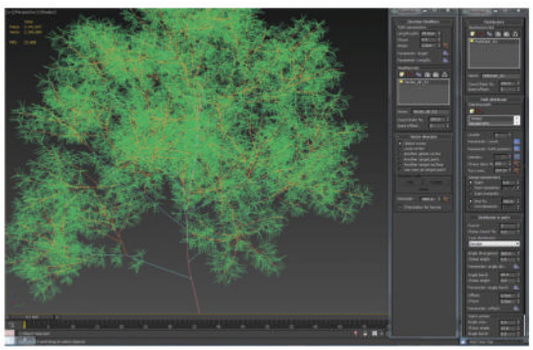
Another useful feature is the ability to copy and paste a graph





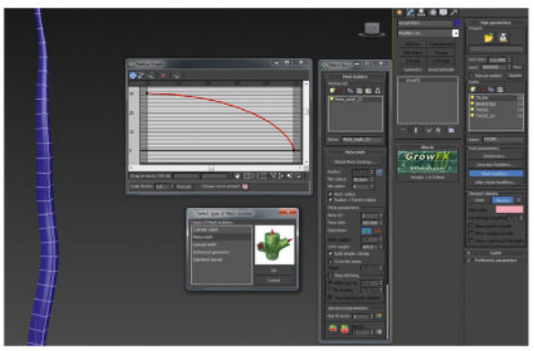
12 COPY AND PASTE

Another useful feature is the ability to copy and paste a graph. This is needed to copy and paste the Affect graphs from steps 9 & 10 for levels and path position, which quickens the process. After doing this, pick twigs as the starting path and again, set the levels to 2. Create a density graph, with a straight line rising from 0 to 60. Give a Count Value of 3. Chaos Angle should be set to 15.



13 ADDING GRAVITY

These shorter, lightweight twigs will be starting to adhere more to gravity and start to hang from the stronger branches below. As before, we need to add a Vector Direction modifier only, with a value much lower of -800. Combine this with a length of 28cm and a Steps Value of 2 and the model is much closer to being finished. The meshing of the tree can now begin, before finishing with the addition of leaves.



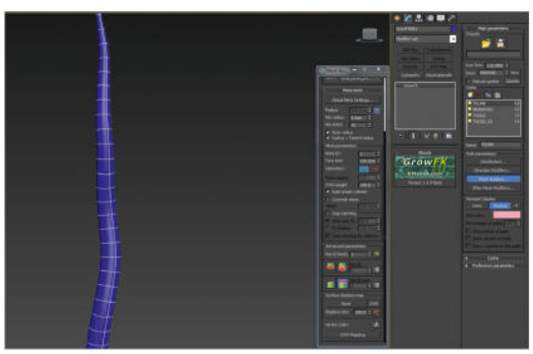
14 START MESHING

It's time to go back through our tree layers and start meshing the tree. Click the trunk layer and open the Mesh Builder window. Go to Create Mesh and select Metamesh. This is a higher poly option to cylinder but is vastly more realistic for junctions between paths. Create a graph for mesh radius and create a bezier decreasing from a value of 20 to 0. In the GrowFX tab, go to viewport display and select mesh instead of lines.

EXPERT TIP

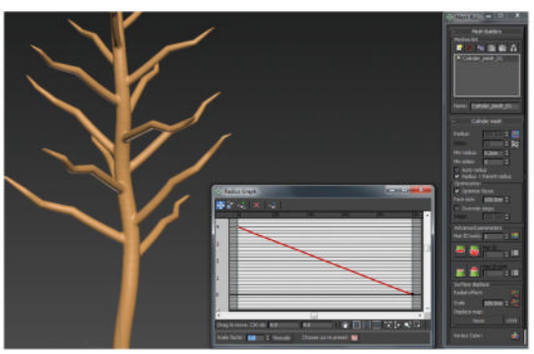
Keep your scene optimised

Make a decision early on. This model is detailed for closer cameras, but if your model is only viewable at a distance, you can construct your model to be much lighter.



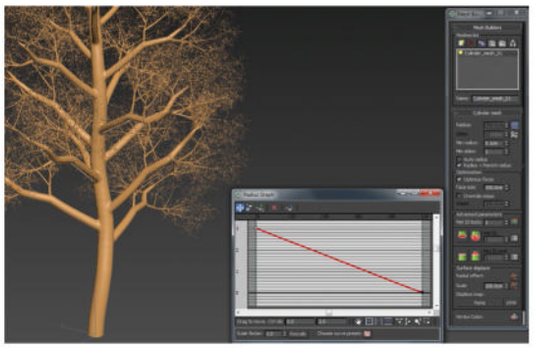
15 TRUNK MESHING CONT.

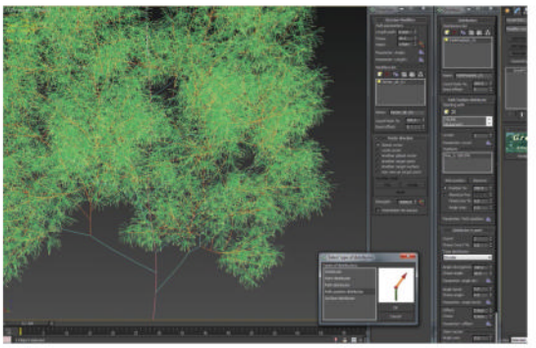
The trunk currently appears faceted. To solve this issue, increase the minimum sides to 16 to give the mesh a smoother surface. There are also options to give the mesh ends a flat or rounded shape. For the 'end' give the mesh a rounded shape. And finally set the material ID to 1, which will come into use when texturing using a multi-sub object material. We now need to repeat meshing for the remainder of the tree.



16 MESH THE BRANCHES

Now repeat the actions of step 15 for the branches layer. Metamesh, but only this time set the radius graph to a value of 14, with a smooth bezier decreasing to 0 and a minimum radius of 0.2cm. Again, this mesh will need smoothing so increase minimum sides to 14 and again give a Mat ID of 1, which will be the bark once we start texturing.





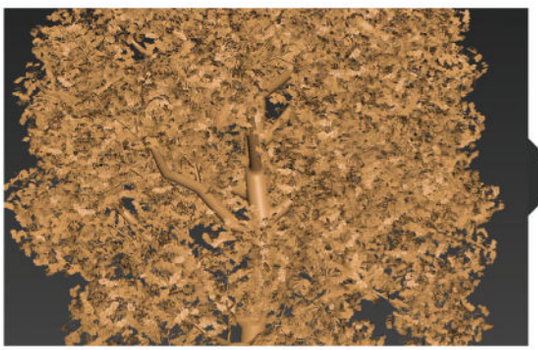
OTHER MESH OPTIONS
Instanced geometry is great for using pre-modelled geometry, such as flowers and berries and Standard leaves offer a variety of low poly shapes

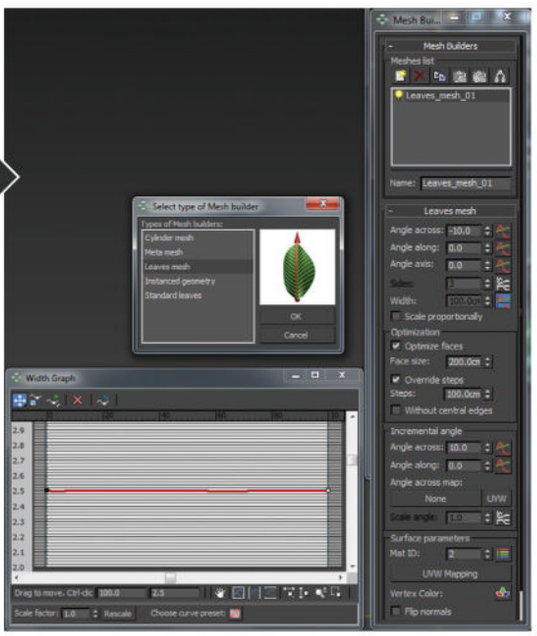
17 USING CYLINDER MESH

For both twig layers of the tree, meta mesh will not be necessary. Selecting cylinder mesh will suffice due to the decreasing radius and visibility of these elements, this will ensure the model isn't too poly heavy, without sacrificing realism. For the 'twigs' layer set a radius graph of 3 decreasing to 0 with a minimum radius of 0.2cm. Copy and paste this graph to 'twigs 02' with a slightly lower minimum radius of 0.1 for thinner ends.

18 ADD PATHS FOR LEAVES

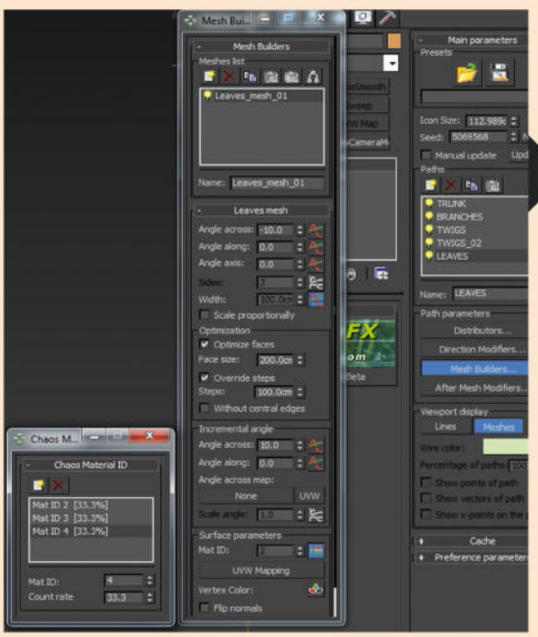
Add a Path Position distributor and pick all paths as starting paths. Click Add Position. Give the Count Parameter a value of 3, set type to Angular and set Angle Divergence to 140 and a Chaos Angle of 20. In the Direction Modifier menu set Length to 10cm and Chaos to 20. Add a Vector Direction modifier and set to -5000 to replicate gravity. Add a vector orient to ensure the leaves are face side up.

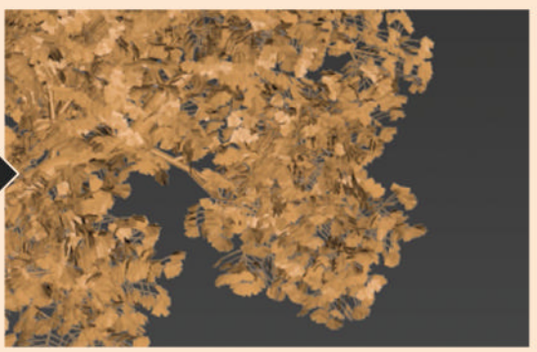




19 CREATE THE LEAVES

Select the Leaves mesh in the Mesh Builder menu. It has a slightly higher poly than other options but has more bend detail. The width parameter controls the shape and size of the leaf. Open the graph, this current graph line is increasing the width in the middle before tapering off again at the end. We won't need this as we'll be using an opacity map for the leaf shape, so set the graph to a straight line with both values to 2.5 to create a rectangular shape.





20 SET MULTIPLE MATERIAL IDS

To give the leaves more colour variation when it comes to the next step of texturing, set multiple material IDs. Click the button next to the Mat ID parameter called Parameters for Chaos Material ID. Here you can add multiple ID's and specify a percentage of the leaves you would like this ID to cover. Set three extra IDs for 2,3 and 4 and set each percentage to 33.3%.

IVY CLIMBING PLANTERS

GENERATING IVY USING GROWFX



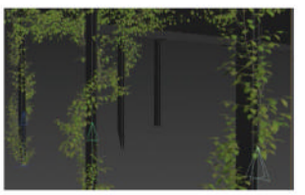
ONE USE POINT DISTRIBUTORS

This distributor lends itself well as a starting point for ivy. You can now create points and click in the viewport where you would like the ivy to start growing.



TWO OBJECT REACT MODIFIERS

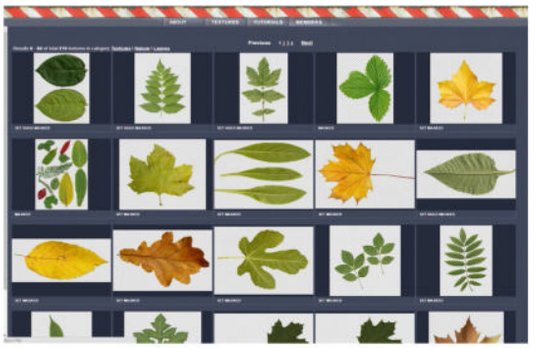
Object react is very useful for growing around Max geometry. Make sure Magnetic is ticked, pick the object and have a play with strength parameters to get the climbing ivy effect.



THREE USING OBJECT SLICE

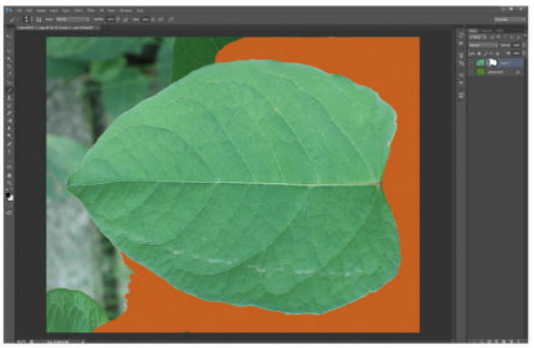
Object Slice is another helpful modifier when creating vegetation that interacts with geometry. By adding this you can pick objects that would like GrowFX to not grow through, avoiding messy intersections between meshes.

EXPERT TIP
Quick Mask mode
To activate Quick Mask mode press [Alt]+[Shift] and click the mask directly in the layer stack. This creates a 50 per cent translucent red overlay that indicates masked out areas.



21 SOURCING TEXTURES

A great and well used tool for decent textures is www.cgtextures.com. Reasonably priced for high resolution texture maps. It was particularly useful in this project for its bark and leaf textures. Shutterstock is another good website for sourcing textures for your projects. You can download the maps I have used for this model through the download link.



22 MASK LEAF

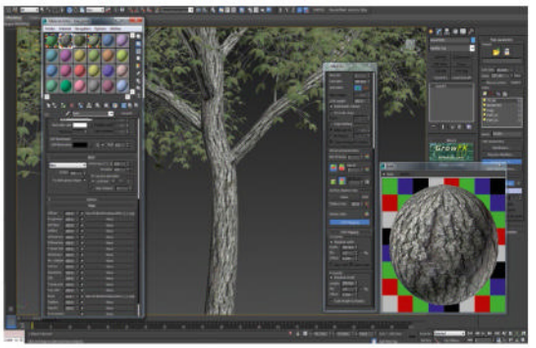
Bring the image into Photoshop, copy and paste it onto a new layer and make a fill layer of block colour behind. With the leaf layer selected, click Add Mask. Choose a brush with a hard edge, make its colour black. Now you can paint a mask around the leaf, leaving the leaf area white in the clipping mask and the background you don't need is black. You can now create diffuse and alpha maps with this selection.



CREATE GRASSES

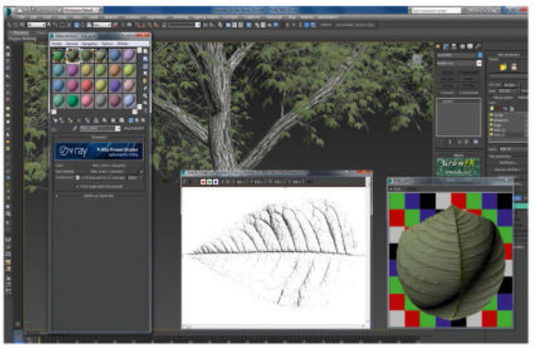
Using surface distributors

The surface distributor has great uses for modelling grasses, as well as dandelion seeds and more. Create a base surface from which you would like GrowFX to be distributed, in the instance of grass a flat circular surface tends to work out well. You can then pick this object as a base and start increasing the density of paths and tweaking parameters. In this grass example, this can be broken down into three layers: the stems sprouting from the surface, green grass blades sprouting from the stems as a path distributor, and some low lying brown and dead grass underneath. Once you have created your model, if the base geometry is not intended to be visible this can always be put on its own layer and hidden with the GrowFX model unaffected.



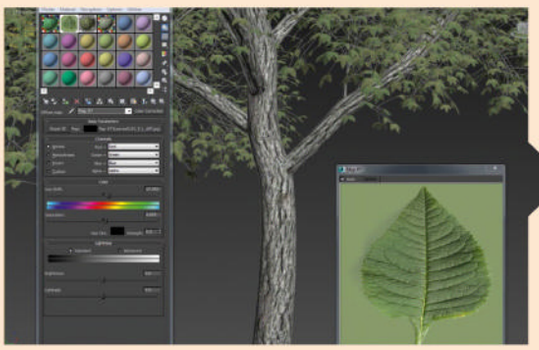
23 GROWFX UVS

GrowFX geometry comes nicely unwrapped. The bark texture may look out of scale when you apply it so it might need some tweaking in the Mesh Builder menu. Click the UVW Mapping button at the bottom of the window and tick Absolute Width and Length. Set both values to 200cm which should give the mapping appropriate scaling to the model.



24 TWO-SIDED MATERIAL

In the Material browser click Get Material and create a two-sided material. In the front side slot create a glossy leaf shader. The back material needs to be a lighter coloured, less reflective version for the back side of the leaf. Create a black and white translucency map of just the leaf stem and veins in Photoshop to dictate the two-sided material's translucency. Veins being less translucent than the leaf.



25 COLOUR CORRECTION MAPS

Once you've created your two-sided leaf material add more variation and realism by creating another two copies of the material in the multi-sub so it takes up three slots: 2, 3 & 4. On the copies, go into the diffuse slots of your materials, and add a colour correction map. You can shift the hue, alter gamma and contrast and give the leaves subtle variation when it comes to rendering. Now test your model and materials in your scenes to evaluate, tweak and render until happy. ■



SECRET LABS.XYZ

COMING SOON

CHARLIE WEN
TRAVIS BOURBEAU
JOSH HERMAN
DAVID FINCH
HANNAH KANG
JEAN-ERIC HENAULT

REGISTER TODAY

AND BE PART OF OUR BETA INVITE FOR SOMETHING NEW

www.secretlabs.xyz

ZBRUSH | KEYSHOT

MASTER PERSONALITY IN YOUR 3D ILLUSTRATIONS

Hannah Kang reveals how to learn from master artists to improve your 3D art



ARTIST PROFILE
Hannah Kang
Hannah is a graduate of the Gnomon School. She currently works as a 3D artist at Legacy Effects in California.
hannah_kang.artstation.com

TOPICS COVERED
- Character design
- Detail modelling
- Composition
- Rendering
- Compositing



Before starting off a personal project, I like to brainstorm and choose wisely (to my best ability) why I want to be modelling a certain subject. What drives me the most towards a direction for my project is the story aspect. Creating scenarios and stories in my head makes the process much more enjoyable instead of creating random characters or scenes. I like feeling connected to my work because without that, I would be creating an empty, but pretty, image.

One artist that I admire very much is Norman Rockwell. He was the master of telling stories, of composition, and most of all, his draftsmanship was superb.

In this tutorial, I wanted to focus on personality and composition, while keeping it cute and playful; putting my own modern twist while observing the skills like composition and mood in Rockwell's original painting. When beginning the piece, I discovered Rosie the Riveter, a wartime poster Rockwell had created in his own style using Michelangelo's Isaiah painting to model it from.

I had set out to accomplish a personal level of sylisation between Disney and Rockwell. Feature animation has always been what I had a passion for. Even before I began this project, I knew my project was going to be stylised. However, what I wanted to achieve was the in between of realism and feature animation. I knew that even if my characters were stylised, I wanted them to have form and anatomy while also retaining a stylised look.

For all the assets you need go to creativeblog.com/vault/3dw205





1 FIND THE CHARACTER'S FACE

One of the first steps was understanding the anatomy of the face; why certain features make the face look a certain age. The age I was aiming for was around the age of seven to 10. By sculpting from an actual face and taking it back down to the level of realism you want, was a way to understand what I was hoping to achieve. At a very early stage of a project, is the time to explore and figure out what you want.

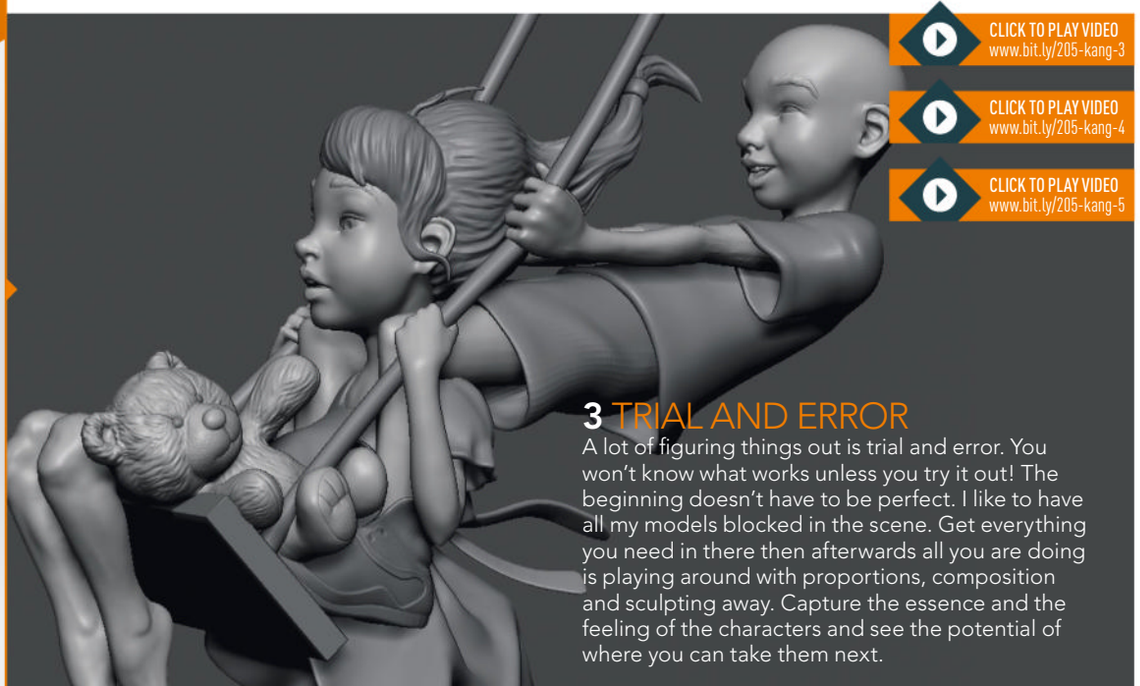
2 BLOCKING OUT

When I block out my characters, I mainly use either ZSpheres or DynaMesh in ZBrush. At a very early stage, it was hard to make the characters turn out the way I wanted them to. When blocking out my characters, I go through a creepy stage, where all my characters don't look like they're all the way there yet. The moment I added the smile to the face, it made the boy look strange. I had to figure out how to make his face look less creepy and make it look appealing.

EXPERT TIP

Plan your goals

What do you want your image to look like? Is it more of an illustrative piece or more of a hyper-realistic scene? Depending on what you want it to look like, you may texture or render your models differently. It's all up to the artist! Knowing early on what your end goal is, helps you get there more smoothly.



TAKE A BREAK

Don't keep sculpting away. Step back, evaluate, and make critical moves. Have a reason why you make certain decisions

3 TRIAL AND ERROR

A lot of figuring things out is trial and error. You won't know what works unless you try it out! The beginning doesn't have to be perfect. I like to have all my models blocked in the scene. Get everything you need in there then afterwards all you are doing is playing around with proportions, composition and sculpting away. Capture the essence and the feeling of the characters and see the potential of where you can take them next.

LEARN TO FOCUS

Ask for advice and refocus

Being stuck in one area and not being able to progress forward, can really bring things to a halt. For the boy, the expression was a big challenge. With that situation, getting tips from people you trust – in this case my art director and friend Scott Patton – to duplicate the boy's face, forget the body, and concentrate on trying different expressions of the face. Focus on the area you are having trouble with.





4 MOVING FORWARD

It's good to step back and see where your overall project is heading. Stepping back and taking a little break from your work helps you see some mistakes you may have missed. For example, with the pants on the boy, I sculpted them folded over to see if that style of pants was going to work. But after stepping back and taking a look at it, it was breaking the line of action. Something minimal can make a big difference in the overall picture.



5 GRADUALLY ADD DETAILS

As the project starts to tighten up, I begin finalising the details more. I don't get too fancy with the brushes. I mainly use the Clay Build Up, Standard Brush, and Dam_Standard. Using different alphas helps achieve a variety of stylisation within the brush. During your process, if you're not happy with something that isn't turning out quite the way you want it to, leave it and come back to it.





6 DETAIL, COLOUR & TEXTURE

I've decided to do all my texturing in ZBrush. I knew early on that I like being able to sculpt and texture as I go. Both goes hand in hand. When texturing, many times you can hide mistakes that weren't the focus of this exercise. Hence being able to sculpt and texture at the same time is a process that I very much enjoy. Always keep in mind what your end goal is.



7 FLOW AND RHYTHM

Adding movement to your models, helps sell the image. The standard T-pose model doesn't cut it anymore. When adding movement, think about which way the direction of physics is happening. For example, if the direction is going at a diagonal, follow the diagonal movement – almost parallel to it. Of course there are exceptions, not everything is going to be 100 per cent parallel.

EYE MOVEMENT
Avoid lines that cross the flow. Composition being important, you want to be able to move the viewer's eyes around the image easily



8 WIND BACK DETAILS

You want to be consistent with how much information you give with all the models. On the scale of realism, one being cartoony and 10 being realistic, it is better to have everything four or six rather than having two and 10. The teddy bear here may have been approaching a seven. I needed to make sure I pulled back so that it is in the same world with the rest of the models.



9 TAKING IT INTO KEYSHOT

KeyShot Bridge is such a great tool to use in your pipeline. It makes the process much easier and saves you so much time by not having to do UVs, export and import .obj files. What I suggest doing early on, is taking it to your render engine and checking how your model is looking under lighting. You won't believe how different your model can look from ZBrush to lighting your models.

KeyShot Bridge is such a great tool to use in your pipeline. It makes the process much easier and saves you so much time

Do test renders and see what your models are really doing



10 KEYSHOT CONTINUED

You are able to see what your models are lacking and areas you need to push. Having the model and textures at a good place, I come to a point where I am tweaking my models, textures and lighting all simultaneously. You come to a stage where everything has to work harmoniously. Do test renders and see what your models are really doing. You will get the answers you need.



11 CONTROL YOUR LIGHTING

Being able to manipulate your own lighting is such a huge benefit! Depending on how you light your models can make a huge difference. You can create the type of mood with just lighting. I add a plane geometry in KeyShot and assign an area light to it. I usually like having my main key light on top to mimic sunlight, fill lights on the sides and back light for some nice rim lighting. Play with the intensity and colour of the lights.



COLOUR ADJUSTMENT

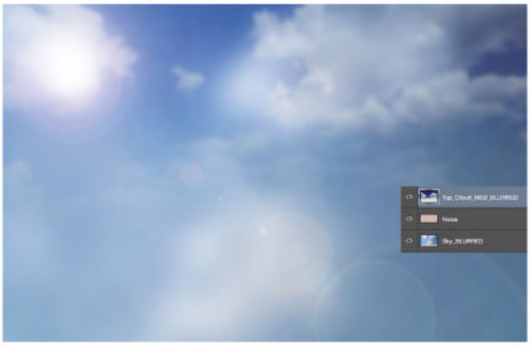
Ask for advice and refocus

Punching the colours by adding some blues to everything, helps integrate the image and bring everything together. I use soft light for the layer blending mode, then Levels to punch up the colors. This is simple, but works!



12 RENDER AND COMP

After getting to where you think is a good place to composite in Photoshop, it's time to make render passes. I don't get too crazy with the render passes. I render what I need. You don't have to be fancy or complicate yourself to get a nice image. Make sure your camera view is locked when you start rendering. The main passes I create are a master render, ambient occlusion and a mask.



13 ADD A BACKGROUND

I google a sky with clouds background. On the bottom layer, I add the sky image and use Gaussian Blur to create a foundation, then overlay another layer of clouds. To add more noise, I use the Photoshop feature (Filter>Render>Cloud). I use the Soft Light blending mode and take the opacity down. Using layers subtly to create one whole image makes for a better image. On top of the cloud layer, I add another cloud layer and Gaussian blur it slightly to blend, then I add a lens flare.



14 REFINE THE HAIR

For the hair, I cheat a bit by painting in the strands myself. I get a Standard brush in Photoshop and make the brush size very small. I use the Color Picker on the base colour of the hair and I start painting the strands. It's a back and forth process from from highlights to shadows. To show certain areas of the hair looking brighter, I change my brush mode to Color Dodge. Always experiment and try using different brush modes to discover new effects.



15 TWEAK IN PHOTOSHOP

In Photoshop, this is where you can make your models look even better! I add a background and use the Color Picker to add a blue hue over the whole image, then put it on Soft Light blending mode so the colours all match. This is a good time to add noise, filters and variations to your image, but for now I was able to pick up some great compositional tools from one my favourite illustrators. ■

THANKS ALL!
Hannah would like to thank Travis Bourbeau and Scott Patton for all the help with this project!



3D WORLD

ISSUE 206

NEXT MONTH

Artists from Naughty Dog, Insomniac, Epic Games and more reveal how to break into video games

FREE!
VIDEOS
MODELS
& FILES

ISSUE 206, ON SALE 24 FEBRUARY

PLUS: DISCOVER THE CG TECH BEHIND FINAL FANTASY XV! SUBSCRIBE TODAY: **www.bit.ly/3dworld-subs**



GROW YOUR TREES
The Grove offers fantastic results, as used by Mason Menzies in this render
www.artstation.com/artist/masonmenzies3

THE GROVE | BLENDER

HOW TO EASILY CREATE REALISTIC TREES

Wybren van Keulen shows how to grow true-to-nature trees with Blender's new plug-in, The Grove



ARTIST PROFILE
Wybren van Keulen
Wybren creates visuals for designers and architects. Blender is his trusty companion and coding tools for CG is his ultimate creative endeavour.
www.thegrove3d.com

TOPICS COVERED
- Tree growth
- Bend
- Environment objects
- Branches
- Twigs

Instead of modelling trees, The Grove enables you to grow trees. It sounds simple enough – and it is. The new plug-in for Blender creates trees by simulating their growth. It speeds up their year-by-year development; first growing new twigs, then bending branches under the added weight, and before growing another year, pruning shaded and weak branches.

The Grove is a simulation-based algorithm that evolves true-to-nature trees, with good results at every year of a tree's life – from sapling to hero trees. However, best of all is that it's easy, fast and incredibly fun to play with.

In this tutorial I'll show you how to get started with The Grove. We'll begin by picking a preset, repeatedly clicking the Simulate button, and watching nature take its course. You'll witness branches grow, branches bend, and branches disappear by pruning – all done for you automatically. A tree's shape depends on its DNA, the hormones that flow through its branches, and last but not least, how it looks depends on its environment. These three things give you control in a very natural way.

The Grove is a simulation-based algorithm that evolves true-to-nature trees, with good results at every year of a tree's life

The simulation-based approach of The Grove means that it evolves natural trees, year after year, in order to achieve unrivalled results.

You can also take control by tweaking the many parameters to get the character you're after in your own tree.

In this tutorial I am going to give examples on how to grow trees in every shape that you can imagine. You are going to learn how to set up an environment to attract, deflect or stop new growth; avoid buildings, simulate a dominant wind direction and create topiaries.

For all the assets you need go to creativebloq.com/vault/3dw205



1 CREATE A BASIC GROVE

Here we're going to create beautiful combined crown shapes when we grow several trees together. Place and rotate one or more Empty objects to tell The Grove where to start growing trees. Next, select your Empty objects and go to Add>Mesh>The Grove, and start growing. The trees interact with each other and the space they exist in. As they grow they prune each other and with age they will form a natural group similar to those you see in nature.



2 FLOW AND GROW

The crown shape a tree evolves into is also dependent on hormones flowing through the branching structure. Favour main over side branches with Favor Current. Boost crown growth over lower branches with Favor Crown. Negative values create heavy side branches and a less apparent main trunk. The Branching Loss parameter controls the inefficiency of a branching point – reducing growth power for each successive branching generation – to fill the crown in a shrub-like fashion.

EXPERT TIP

Shade avoidance

A tree competes for light with its neighbours, just as well as its own branches. Use shade avoidance and shade-based gravitropism in order to get a good distribution of heavy branches and foliage.



3 CONTROLLING THE BEND

Branch Weight controls the bending of branches under their own weight, and this can be used in order to create weeping trees. Bending at each node increases with the amount of nodes it carries and decreases with branch thickness and branch verticality. As branches grow in width, they strengthen and limit bending. You can also affect the bend of a tree by altering the Leaf Weight controls; heavy leaves cause thin twigs to droop, while strong twigs tend to bend up to the sky.



4 CREATE TOPIARIES

Use an environment object to attract, deflect or block new growth. An environment object will affect tree growth by blocking growth, attracting growth or deflecting growth. Use combinations of these effects to make your tree avoid a building, grow towards a light source, or grow within a topiary shape. Use the preset Topiary as a starting point, then experiment and get creative.

ENVIRONMENT OBJECTS

Create dramatic tree growth

Type the name of the object to interact with into the Environment text field. A simple mesh object with just several polygons can have a striking effect, or use the stylised shape of a building to avoid it. Use complex shapes to create a topiary. With the object selected, its name appears in the lower left of the 3D viewport.

If The Grove can't find an object by that name, you see a warning below the Environment field. The object has to be on a visible layer for interaction to work. The attract and deflect interaction types have a radius of influence. When a branch grows within this proximity, it gets influenced by the environment. The closer it gets, the more powerful this effect becomes. The Force parameter multiplies this influence. Environments are not static; surrounding trees come and go, changing the tree's exposure to light and wind. Try enabling interaction for just the last years, in order to simulate a windswept tree.



5 BUILD BRANCHES

After simulation, create a curves or mesh model of the branches. Start with a Tip Thickness matching with the twig's thickness, for a smooth transition. Then add character to the branches using the Branching Thickness Exponent. The trunk will seamlessly disappear into the crown. Use the polygon reduction tools for a lightweight mesh.



6 DISTRIBUTE TWIGS

Twigs take over the last growth state by distributing linked copies of modelled twigs, duplicated along branches and placed in orientation to the sky. Using a small, modelled twig model will save huge amounts of memory and means you can also model fruit and so forth. Twigs are placed and rotated automatically so long as you make sure your leaf or twig object points to the right when in top view. Press [Ctrl]+[A] to apply size and rotation. ■

FOLLOW THE VIDEO

If you see the Play icon, use the link!

MARVELOUS DESIGNER 5

CREATE A DYNAMIC RENAISSANCE DRESS

Camille Kleinman shares her process for creating a realistic dress in Marvelous Designer 5



ARTIST PROFILE
Camille Kleinman
Camille enjoys drawing and sculpting, and teaching others the art of digital clothes design. She is an expert in Marvelous Designer and has a video training program for those wanting to master the tool.
www.CGElves.com

In this tutorial you'll learn how to create a beautiful, dynamic 3D dress using Marvelous Designer 5 (MD5) – the cloth simulation software used by leading artists and studios to quickly create clothes for 3D models.

Used on games like Assassin's Creed and Metal Gear Solid V, as well as major motion pictures including The Hobbit, Ted and the Adventures of Tin Tin, MD5 is fast becoming the industry standard.

Since the cloth is dynamic, whenever you change your 3D model's pose, the clothes adjust themselves accordingly and hang realistically. You can even animate the cloth and add wind to make it billow. MD5 cuts down on the time it takes to create clothes. Without it, you'd need to spend hours sculpting each fold and wrinkle in the 3D cloth. Then, if you needed to change your model's pose, you'd have to re-sculpt the wrinkles all over again.

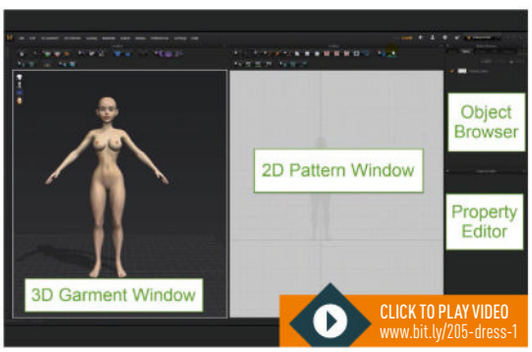
Aside from the time it takes to sculpt clothing, one has to spend even more time studying cloth anatomy and invest a lot of time practising in order to be able to sculpt clothes that look realistic.

MD5 uses a pattern-based approach to making 3D garments, similar to tailoring in the real world. To design clothes in MD, you need to create each piece of the puzzle, which are your patterns, and sew them together.

Thankfully you neither need to become seamstress nor get your fingers pricked by needles, but you will need to learn the art of digital clothes making. Let me show you how easy it is!

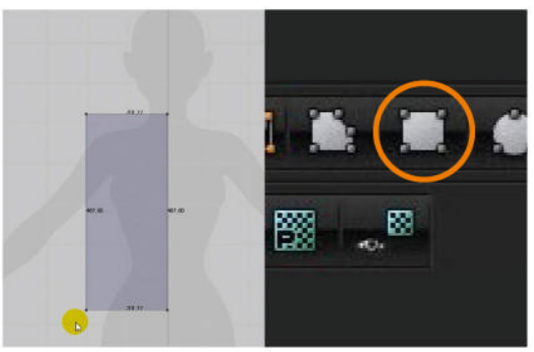
To make the most of all of MD's features, you'll need to learn the program properly. However, we can't cover every function and button of MD here, so I strongly recommend that you get my Marvelous Online Video Training Program from the CG Elves site: www.CGElves.com/LearnMD.

For all the assets you need go to creativebloq.com/vault/3dw205



1 KNOW THE SOFTWARE

The 2D Pattern Window is where you create and modify patterns. The 3D Garment Window is for seeing what your clothes look like when you simulate them. In the Object Browser pane you'll find the Scene tab, the Fabric tab, the Arrangement Points tab, Bounding Volumes tab and the Measure tab. The Property Editor is where you can change settings for fabric Physical Properties, fabric thickness, Particle Distance, sewing line type, and so forth.



2 CREATE THE BODICE

Most clothes are made from many pattern pieces. To start, I'll create the patterns for the bodice. The best way to keep both sides of your bodice symmetrical to one another, is by first creating half a bodice and then creating a copy from it for the other side. So, to create the bodice patterns, we'll begin by using the Rectangular pattern tool, to draw out a rectangle somewhat wider than our avatar and about the length we want the bodice to be.

TOPICS COVERED
- Patterns
- Sewing tools
- Simulation
- Posing
- Animation

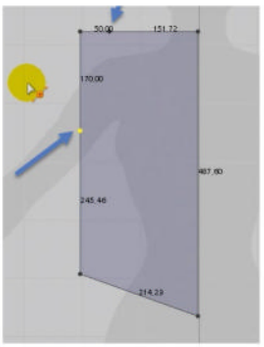


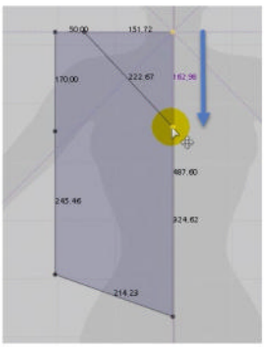
WINDOWS DRESSING
To create this dynamic 3D dress, you'll need to install Marvelous Designer 5. If you have a Mac, Camille strongly suggests using Bootcamp with Windows. From her experience, MD5 functions faster and better that way

EXPERT TIP

Place segment point

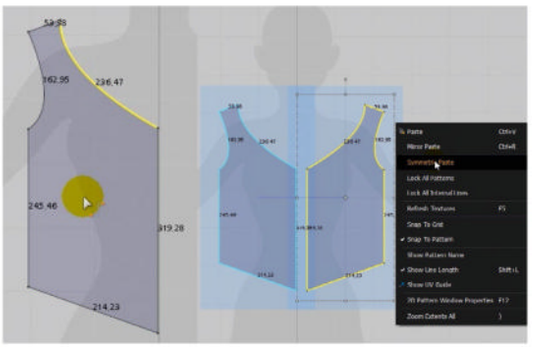
To accurately place a Segment Point at an exact length where you want it to be, right-click on the Segment Line. A pop-up box will open. Select the first option Split Into Two Lines, and type in a length value where you want the Segment Point to be placed.





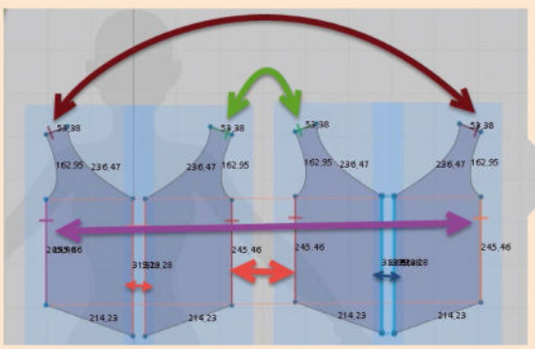
3 USING SEGMENT POINTS

Using the Split Line tool add two Segment Points. Let's add one Segment Point at 50mm from the top left corner (this will be for creating the shoulder strap), and the other Segment Point we'll place at around 170mm from the top left corner (this is for making an arm hole). Using the Edit Pattern tool, let's lift up the bottom left Segment Point to create a pointed front design for the bodice, as well as lower the top right point to create an open cut shirt.



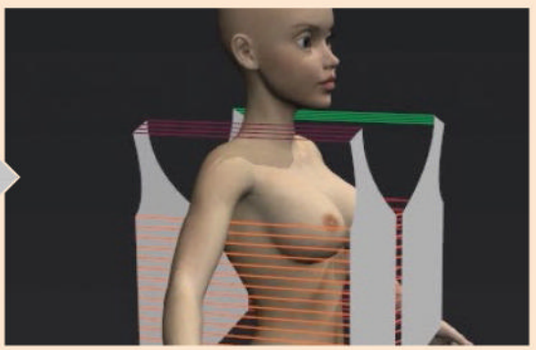
4 MAKE IT SYMMETRICAL

Use the Curve Tool to create the openings for the neck and the arm holes. To make sure both sides of our bodice are symmetrical, copy the pattern piece [Ctrl]+[C], then right-click on the 2D pattern window and select Symmetric Paste from the pop-up menu. Select both pattern pieces and copy and paste them to create the back of the bodice. Using the World Coordinate Gizmo in the 3D garment window, arrange the pattern pieces around the avatar.



SEWING POINTS

See my arrows – they indicate which Segment Lines need to get sewn to each other



5 SEWING THE PATTERN PIECES TOGETHER

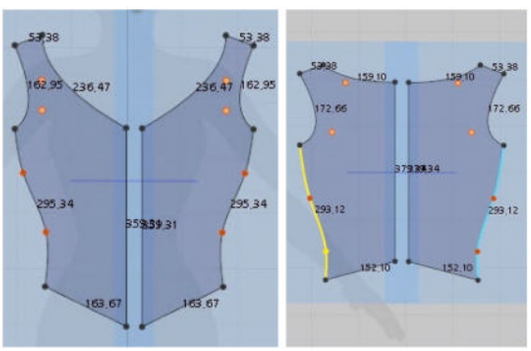
Use the Segment Sewing tool to sew the pattern pieces together. After you've sewn the pattern pieces together, rotate around your avatar in the 3D Garment window to make sure that all of the seam lines are running straight and aren't crossed over. If you see any seams that are crossed over like an X, you'll need to select your Edit Sewing Tool and right-click on that seam in the 2D pattern window and select 'Reverse Sewing' to fix it.

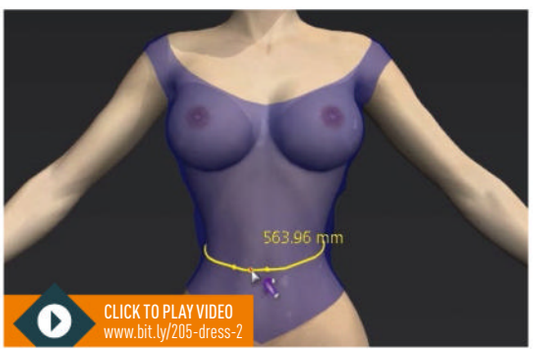
If the seams look okay to you, press the space bar on your keyboard to begin the cloth simulation or click the big arrow on the top left of the 3D garment window. If the seams are messed up and you didn't notice it before simulating, you can always stop the simulation (by pressing the space bar again), undo the action [Ctrl]+[Z] and fix the seams before simulating again.

KNOW YOUR FABRICS

Fabrics can affect your sim

MD fabrics are just like real world fabrics and have inner and outer sides. The inner side is always darker than the outer side of the fabric. For best results, you always want to have the inner side in and the outer side out. When arranging the patterns behind your avatar with the gizmo, (unless you use arrangement points) the fabric's inner side is going to be on the outside, so you will need to flip them horizontally to bring the outer side out, where it belongs!





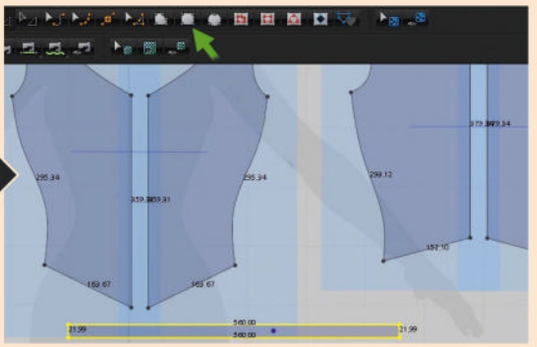
6 REFINING THE BODICE

With the simulation you'll be able to see how the garment hangs on your model. If you find the bodice is too tight or too loose, you can easily change this by modifying the bodice pattern. I want this bodice to be snug and to look smooth without too many wrinkles. So first I drag the bottom Segment Points inwards to make it tighter around her waist. Then I use the Edit Curve Point tool to curve the bodice further inwards, in the places where it's too loose.

7 CREATE THE WAISTBAND

This waistband will be concealed beneath the bodice so it doesn't matter what colour you chose for it. In order to know how wide to create the waistband, measure the avatar's waist with the Basic Circumference Measurement Tool. Select this tool, click once on her bellybutton and then click once more on another spot on her belly and drag the mouse around until you get a circle around her waist, indicating the distance in millimetres (mm).





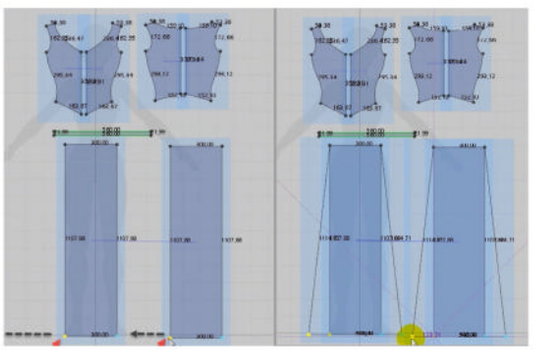
8 TIGHTEN THE WAISTBAND

Now we know how wide to make the waistband, take the Rectangular Pattern tool, click once in the 2D pattern window and type in the appropriate width and height. To make the waistband close around the avatar, segment-sew both ends together. Next, we want to wrap the waist band around the avatar's waist. To do this, use the shortcut [Shift]+[F] to bring up her Arrangement Points and click on her belly point.

EXPERT TIP

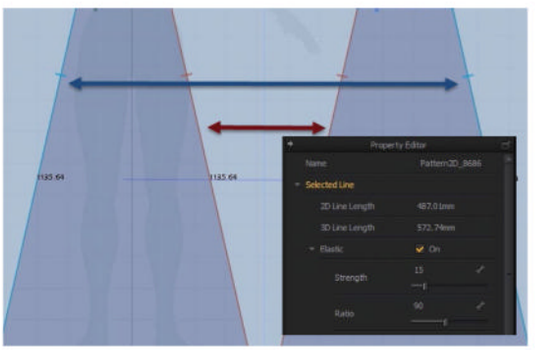
Gathers and wrinkles

If you want to have more wrinkles/gathers on the waist area, then you'll need to make the top part of the skirt wider. To have more folds and more fabric overall, you'll need to make the entire skirt wider. If you want the skirt to have more fabric without more gathers and wrinkles on the waist, simply make the bottom part of the skirt wider.



9 CREATE THE SKIRT

Start by making a long rectangle with the top slightly wider than half the waistband's width. Now copy the rectangle and Symmetric Paste it. Click the left Segment Point on the bottom left corner of one rectangle and hold down Shift while clicking on the bottom left corner of the other rectangle. While holding down Shift key, pull the Segment Points out to the left, making both skirts wider on both sides at the same time, with the exact same proportions.

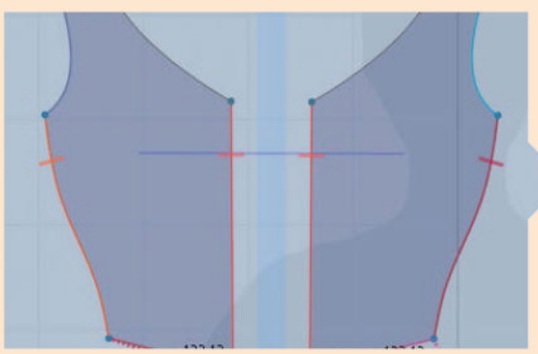


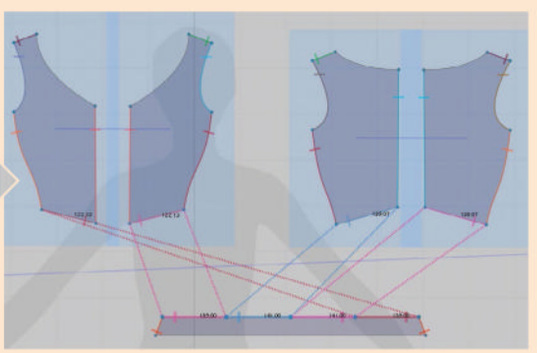
10 SEW AND SIMULATE

Using the Gizmo in the 3D Garment window, position one skirt in front of the avatar and one skirt behind her. Using the Segment Sew tool, click once on the bottom line of the waistband. Then, holding down the Shift key, click once on the top Segment Line of the front skirt and then on the top Segment Line of the back skirt. After letting go of the Shift key, you'll see that Marvelous Designer has sewn both skirts evenly to the waistband.

FLIP THE PATTERN

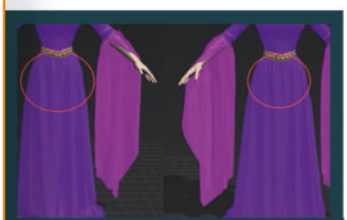
Prior to simulating, be sure to give the back skirt pattern a horizontal flip to reveal the outer side





11 CREATING THE DECORATIVE WAISTBAND

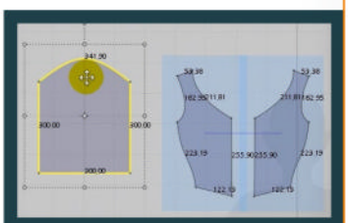
Now that we've made the bodice, waistband and skirt, let's add a decorative waistband over the skirt. Start by adding another fabric in the Fabric pane by clicking on the '+ Add' button. Load in the seamless trim texture to use for the waistband. Next, count and sum up the four lengths of the bottom Segment Lines of the bodice and create a rectangle of that width. To create the pointed design in the front, grab hold of the bottom Segment Point on the left and drag it out, then right-click and type in an exact length. Repeat the same thing on the other side and then sew the two edges together. To attach the waistband, use the Segment Sew tool. Click once on the top Segment Line of the waistband and then, while holding Shift, click on the bottom Segment Lines of the bodice, in the right order, to correctly attach the waistband to the bodice.



WHAT IS PARTICLE DISTANCE?

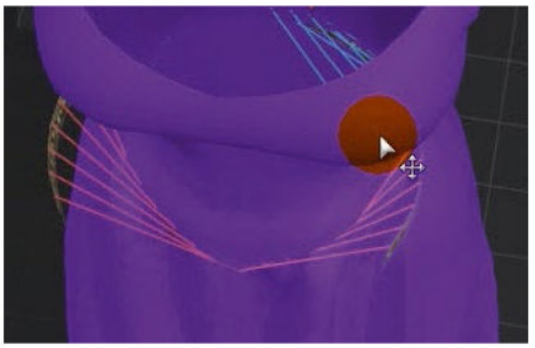
Understanding the finer points of MD5

Particle Distance (PD) makes the mesh denser. In MD5, with low PD values, the clothes will have finer detail but the simulation will take longer. Not all patterns require the same PD; some things like waist bands or tight shirts without too many wrinkles can easily be set to a higher PD, while parts that have a lot of wrinkles and gathers need a lower PD to capture all the detail. To change the Particle Distance, select your patterns, either all at once by hitting [Ctrl]+[A], or by clicking on the individual patterns.



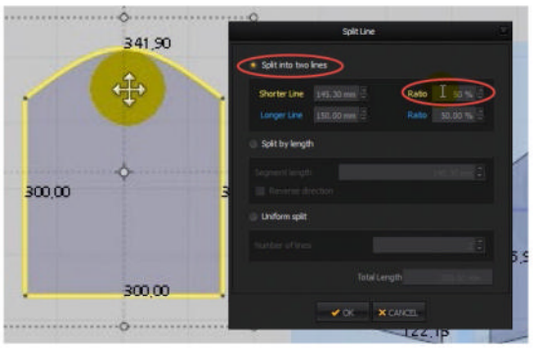
SHORTCUTS
Speed up your workflow

When working in MD5, you'll find that using shortcuts (hotkeys) will save you lots of time. If you don't like using keyboard shortcuts, you could do this instead: before turning the Segment Point into a Curve Point, position the pattern over the grid so that the Segment Point sits on a vertical line. Use that as the centre line reference. Using the Free Sewing tool, sew half of the sleeve onto the front armhole and half onto the matching back armhole. Next, we'll make the sleeve a touch shorter and a bit tighter by bringing in the two bottom Segment Points from either side. Note: make sure that both side Segment Lines of the sleeve are always the same length! If one side is longer than the other, you will get a bunching up problem.



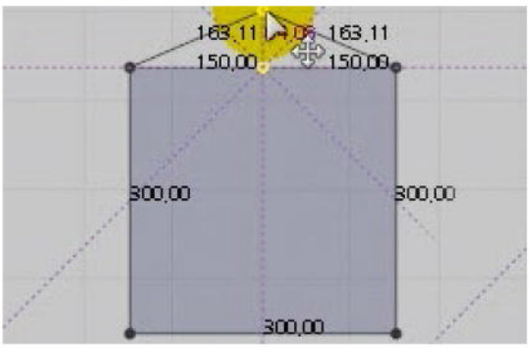
12 SEWING ISSUES

Sometimes a seam gets twisted, so make sure to check your seams before simulating. You can hide your avatar and if you see any seams that are going through the dress or look messed up, simply use the Edit Sewing tool in the 2D Pattern window, right click on the seam and select 'Reverse Sewing'. If the decorative trim texture does not fit perfectly onto your waistband pattern you can always stretch it or scale it up or down using the Texture Transform tool.



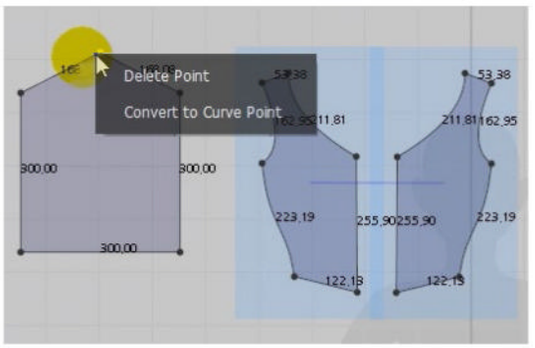
13 BEGIN THE UPPER SLEEVE

To create the upper sleeve, start by summing up the lengths of one (curved) arm hole Segment Line in the front and one in the back. Click anywhere in the 2D Pattern Window with the Rectangular Pattern tool and type in an approximate length in the pop-up box. Next, to find the centre of your rectangle, use the Split Line tool and right-click on the top Segment Line to get the pop-up menu, then type in 50 per cent in the Ratio box.



14 CREATE A CURVE POINT

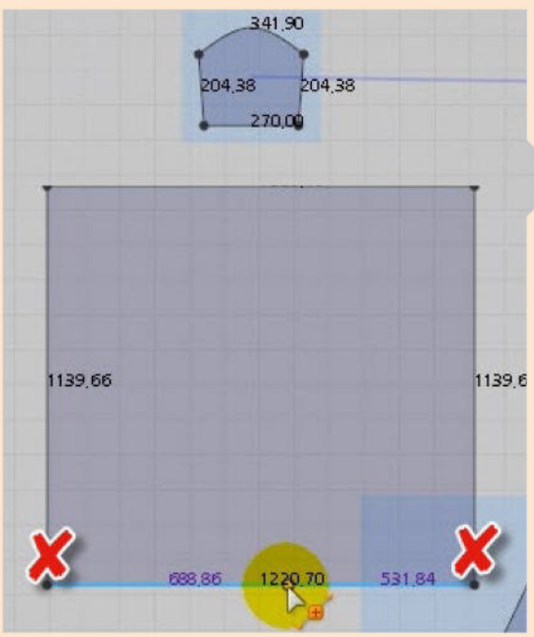
The Segment Point now sits in the centre of the rectangle. Since we cannot position a Curve Point in the centre of the pattern, I use the following workaround to first place a Segment Point in the middle and then turn this into a Curve Point. While holding down Shift key, use the Edit Pattern tool to lift up the Segment Point. This creates a pattern with a pointed top.

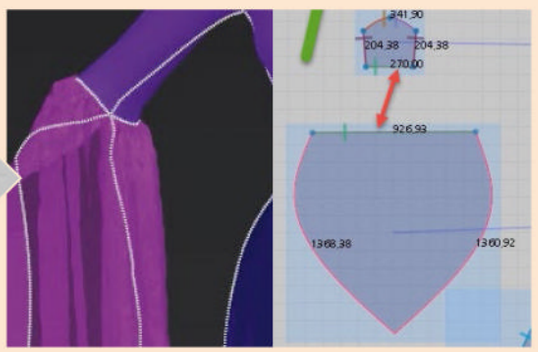


15 SEW THE UPPER SLEEVE

Next, using the Edit Pattern tool, right-click on the Segment Point and select 'Convert to Curve Point'. To sew the sleeve, click on the pattern with your Transform Pattern tool to find the centre line (you'll see a thin grey line indicating where the centre is). Hover over that centre line and, using whatever keyboard shortcut key you've assigned to it, switch over to the Free Sewing tool.

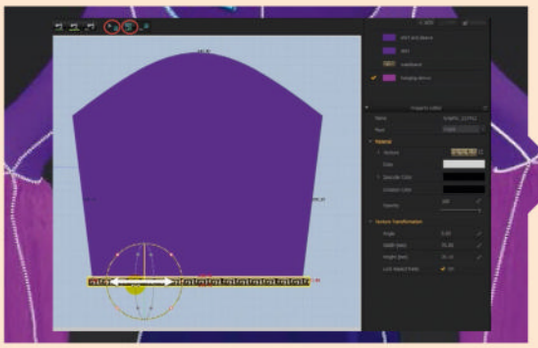
To create gathers and wrinkles, make the draping sleeves wider than the upper sleeves





16 CREATE A DRAPED SLEEVE

Start out by making a rectangle, then add a Segment Point in the centre of the bottom Segment Line and delete the two Segment Points on either side (pictured with red Xs) to get a triangle. To create gathers and wrinkles, make the draping sleeves wider than the upper sleeves. Use the Edit Curve Point tool to curve out the sides of the sleeves. Finally, sew the top Segment Line to the bottom Segment Line of the previously created sleeve.





17 DETAIL AND REFINE THE MESH

To close off the neckline, I choose to run a thin piping line around it. You can assign any colour, texture and material to the piping line and make it any width between 1mm and 15mm. You can decorate the sleeves by overlaying a seamless trim. To overlay an image over your clothes: [1] Click the 2D Graphic Tool (P icon) and load in your trim. [2] To make the seamless trim repeat all along the bottom of your sleeve, use the Pattern Transform tool to stretch the texture. This creates a very distorted looking stretched-out texture. To fix it, use the Texture Transform tool to stretch the texture back into shape (this only works with tiling textures like trims or stitches). You can also go into the Property Editor to change the colours of the decorative trims as well as their specular colour, opacity, and so forth. [3] Finally, in order to get the most amount of detail into our clothes and smooth out the rough lumpy look, we need to lower the Particle Distance (PD).

EXPERT TIP

Particle Distance

If you don't have a powerful computer, you'll most likely want to keep the Particle Distance at a higher value when bringing in a new pose and draping your clothes on it. Once your clothes have draped the way you want them to be, you can lower the Particle Distance.





18 POSE THE CLOTHES

There are several ways to pose an avatar in MD5. One way is to use X-Ray joints to move the avatar's body parts. X-Ray joints are great for interactively moving arms and legs while creating the clothes, to see how the clothes hang in different poses. However, using the X-Ray joints method for creating a pose can be quite challenging and often creates distorted limbs, stretched-out body parts and unrealistic poses.

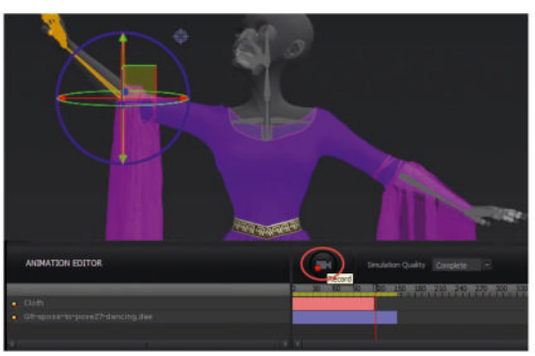
19 ALTERNATIVE POSING

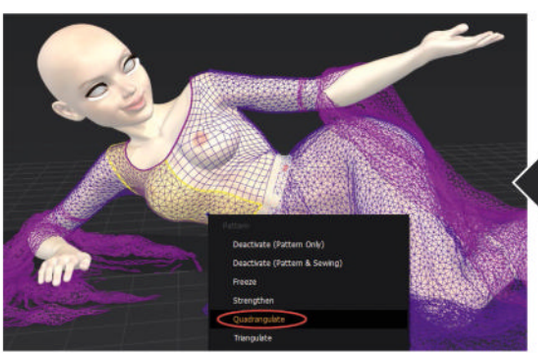
If the X-Ray joints method isn't working, instead I like to import a Collada file and save out the pose, then later re-import the saved pose. You can import a posed .obj model as a morph target. Or, if you have a dramatic pose change, such as from a T-pose to lying down, then the best way to pose your model without running into issues with limbs going through cloth, is to import an animated Collada file and record a short animation.

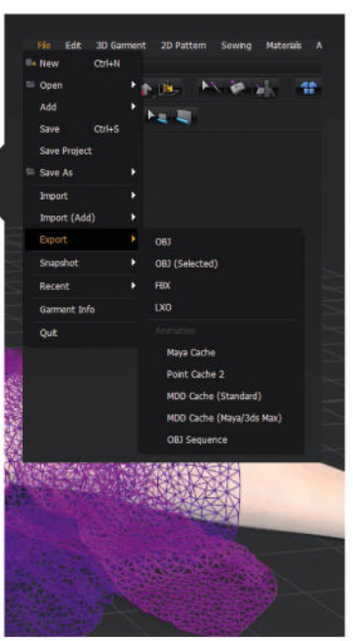
CG ELVES

Money off online training

I hope you enjoyed this tutorial. If you want to know how to quickly create all kinds of clothes for your 3D models, check out my Mastering Marvelous Designer training program at **www.CGElves.com/LearnMD** and use the coupon 3DWorld-special to save 50 per cent!







20 ANIMATE THE CLOTHES

Aside from simulating your clothes on a pose, MD5 also enables you to record cloth animations. Simply import your animated model and click the Record button in the Animation Tab to record a cloth animation. Here are the formats MD5 supports for importing animated models/animation data: FBX, Collada, Maya Cache, Point Cache 2, MDD Cache (Standard), MDD Cache (Maya/3DS Max).

21 EXPORTING THE CLOTHING

Before exporting your clothes, you'll want to make sure you have the right mesh format. By default, clothes made in MD5 have a tri mesh, however if you need a quad mesh instead, you can simply right-click on your clothing in the 3D Garment window and select Quadrangulate. MD5 supports: OBJ, FBX, LXO, OBJ Sequence, Maya Cache, Point Cache 2, MDD Cache (Standard), MDD Cache (Maya/3ds Max). ■

Try out a digital edition for FREE today!

Digital editions feature video and access to extra resource files.
Plus, try our iPad edition for exclusive interactive features!



FREE! VIDEOS, TEXTURES & MODELS

Issue 205 on sale now!

Newsstand for iOS: www.bit.ly/3dworld-app
Print: www.myfavouritemagazines.co.uk/3dwsubs

Download the 3D World app on your Apple or Android device and start your trial today

GET IT ON Google play | Available on the App Store | zinio

CONTENTS

DEVELOP

Theory, research and reviews plus industry insight from today's experts

OUR AWARDS

BEST IN CLASS
Awarded to products that excel in their class.

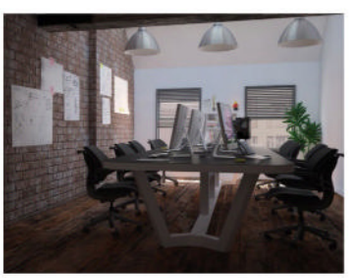
HIGHLY COMMENDED
Awarded to great products that achieve a high standard.



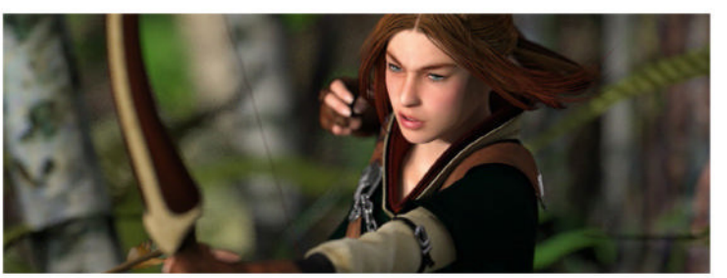
86 GET STARTED IN V-RAY FOR NUKE
Josh Parks offers an introduction to the plug-in's pitfalls and solutions



89 ROBOTS IN FILM
How is technology making them more human?



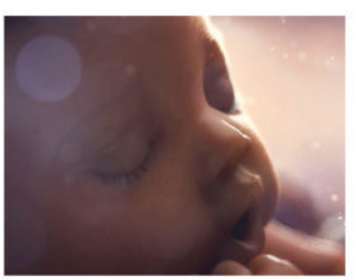
90 UNITY 5 PROJECT
Build your own 3D virtual studio



94 REVIEW: POSER PRO 11
Cirstyn Bech-Yagher trials the character-led modelling and animation software



96 REVIEW: PAINT & STICK
The After Effects paint tool impresses



97 REVIEW: REDSHIFT
The renderer set to dominate this decade



100 MY INSPIRATION
Dave Morley's catalyst for entering the industry

GET PUBLISHED

EMAIL YOUR CG ART TO
ian.dean@futurenet.com

Visit the online Vault to download extra process art for these projects:
www.creativebloq.com/vault/3dw205

PROJECT INSIGHT

An introduction to V-Ray for Nuke

Josh Parks shares the pitfalls and solutions to getting started with the latest tool in the compositor's arsenal

V-Ray for Nuke is an exciting plug-in in the compositor's growing arsenal of gizmos and plug-ins, which are available to throw at a project, in order to make quicker changes to the look of a shot.

As someone who has used V-Ray a little while ago in Maya, I wasn't sure how I felt about the plug-in for Nuke. I like the idea of bringing in all the image sequences and starting from there, with all decisions on textures and lighting having been decided previously in the pipeline. Despite this, I can see a need for compositors to have access to make these changes in Nuke. When I started with the plug-in, I didn't realise I'd be using both V-Ray specific nodes and regular Nuke nodes in unison. As a compositor, using this whole set of new nodes is something I originally thought would feel alien. But the approach Chaos Group has taken allows for the whole experience to feel incredibly natural.

I was lucky enough to be able to meet with Shahin Toosi, a VFX artist with a lot of experience using the plug-in. By using this plug-in he's shown the biggest VFX companies just what is now possible within Nuke, which I hope to be able to do with you.

In this series of articles I'm going to cover how to get started with the plug-in and go over some more advanced uses of it, as well as discuss how I've used it in my workflow. In this tutorial I'm going to run you through my initial questions when I first installed V-Ray for Nuke and cover the solutions step-by-step in order for you to understand just how you could use this tool in your current workflow.

Thanks to Andrew Hodgson at ILM for kindly letting me play with his spaceship model!

FYI *For all the assets you need go to* ***creativebloq.com/vault/3dw205***

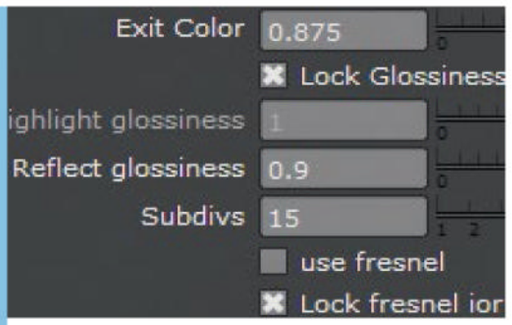


The plug-in uses both V-Ray specific nodes and regular Nuke nodes in unison

AUTHOR PROFILE
Josh Parks
Josh is a compositor at MPC as well as a part-time lecturer at the University of Hertfordshire.
www.joshparks.co.uk

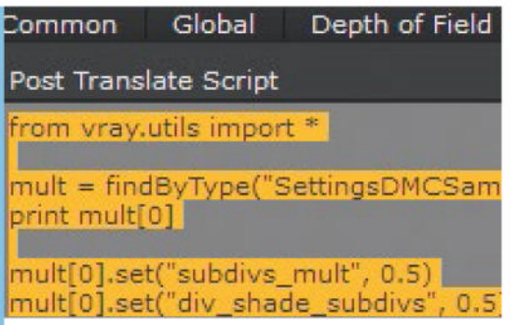
PROCESS: COMMON PROBLEMS

Solving the issues you may have when first using V-Ray for Nuke



ONE REDUCE SUBDIVISIONS WHEN LOOK DEVELOPING

When look developing your materials or adjusting your camera, it's a useful idea to reduce your subdivisions. This will give you quicker render times and allow you to look develop as efficiently as possible. I was originally using a NoOp node connected to the subdivison knob in my Material and Light nodes, that I could then adjust. However, there's a better way of doing this…



TWO REDUCE SUBDIVS CONTINUED

After meeting Shahin Toosi, he made me aware of using a piece of Python that would adjust the subdivision value in any node with a knob labelled subdivs_mult or div_shade_subdivs. This allows you to half or quarter the subdivisions quickly, or increase them for the final render. The piece of script can be found in the Vault. Copy it into the Python panel within the V-Ray Render node.

SCRIPT

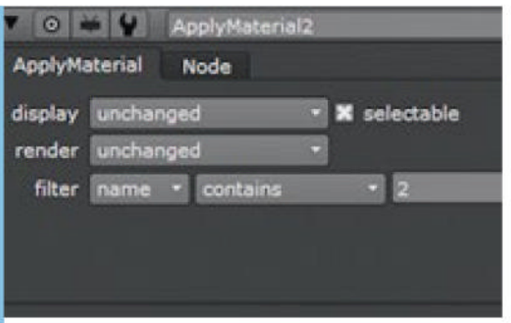
```
from vray.utils import *
mult = findByType("SettingsDMCSampler")
print mult[0]
mult[0].set("subdivs_mult", 0.5)
mult[0].set("div_shade_subdivs", 0.5)
```

You can change 0.5 to any muliplier you want at 0.5 sub division of 2 becomes 1



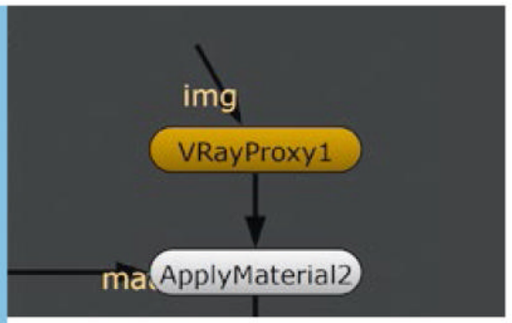
THREE V-RAY PROXYNODE

You can use a VRayProxy node in order to bring your geometry into Nuke in a lighter state, that's quicker to work with. This will stop the geometry being cached until it's needed for rendering and makes the geometry a lot lighter for Nuke to handle. You need to use an alembic file for this. I'll cover exporting alembic files in future tutorials.



FOUR APPLYING MATERIALS PART 1

In order to apply materials to your object use an ApplyMaterial node. Within this node you have the option of applying the material to the whole geometry, or to a certain group containing certain words. Something I've found useful is to number pieces of geometry; this way you can very quickly just put contains "2" and you'll apply the material to this geometry.



FIVE APPLYING MATERIALS PART 2

To do this underneath your read in geometry or VRayProxy node hit tab and put an ApplyMaterial node in. Bring up the properties of the node and next to Filter change the drop-down from All to Name, then the second drop-down to the side will appear. This needs to be set to Contains, then in the box to the right of this simply put in the number 2.

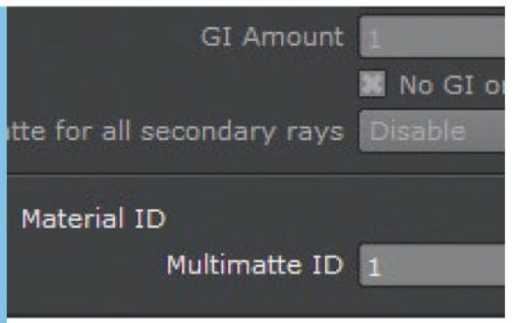


SIX CREATE YOUR OWN MATTES

As someone who comes from a compositing mindset, I found the ability to quickly create my own mattes incredibly useful. I wanted to use the plug-in to get the look I wanted as quickly as possible, and although I could have fiddled with shaders, being able to precomp my V-Ray scene output and go in with Grade nodes was awesome.

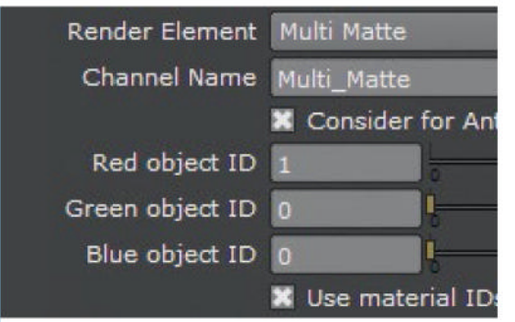
As someone who comes from a compositing mindset, I found the ability to quickly create my own mattes incredibly useful

You've now assigned an ID number to whatever geometry you've set in your ApplyMaterial node



SEVEN ASSIGN AN ID NUMBER

To set up your own mattes you need to first bring in a VRayMtlWrapper and place it in between the VRayMtl and the ApplyMaterial node. Untick all the additional surface properties and matte properties. In the Material ID section give your geometry an ID number. You've now assigned an ID number to whatever geometry you've set in your ApplyMaterial node.



EIGHT CREATE A CHANNEL

To create a channel to keep this ID information, you need a VRayRenderElement node. This allows you to render out your own passes to give more control in manipulating your output further down the comp. Bring this node in by pressing Tab, typing VRayRenderElement and pressing Enter. Change the Render Element to Multi Matte, plug this straight into your scene node and you're done.

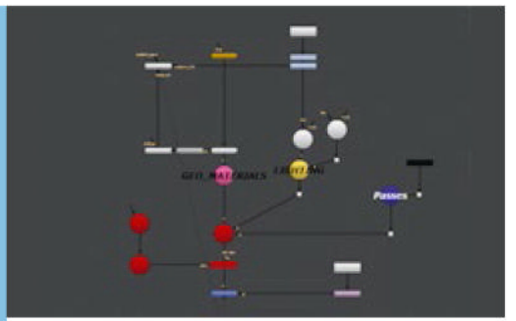
REMOVE CHANNELS

Speed up your workflow

Remember, if you don't need all the channels that you generate out of V-Ray for Nuke, use a remove node to get rid of the unwanted ones. Set it to Remove then select the channel you want to remove, or if you want to remove everything except your RGBA channels, set it to Keep and Select RGBA. This will ensure your script remains optimised.



By Nuke no longer loading extra channels you can work quicker



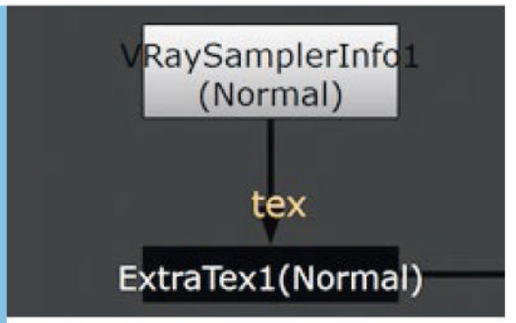
NINE ORGANISE YOUR SCENE

Having a node-based 3D scene in Nuke means you need to come up with a way to organise your scene. I really like having a scene node for each part; one for my lights to plug into, one for my geometry and materials, and another for my VRayRenderElements to plug into to set up my passes.



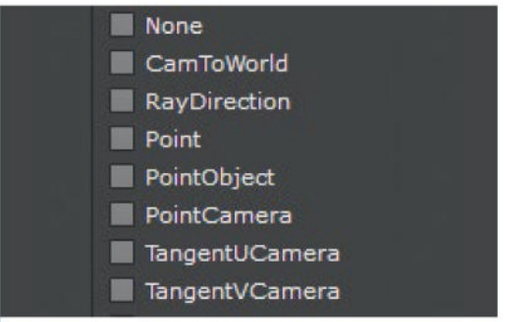
TEN TEXT BITMAP NODE

The TextBitmap node allows you to read in a texture – a little like a precomp, by doing your work on the texture, grades and so forth. Then plugging the TextBitmap node into the Write node. This allows it to read in the written out image sequence without it being cached.



ELEVEN RENDER OUT YOUR OWN DATA PASSES

Something I've found incredibly useful is the ability to render out my own data passes to use later in my composition. You can do this by bringing in a VRayRenderElement and setting it to ExtraTex. This allows you to turn antialiasing off, which you'll want to do with data passes. Next, plug a VRaySamplerInfo node into it by pressing Tab and typing VRaySamplerInfo.



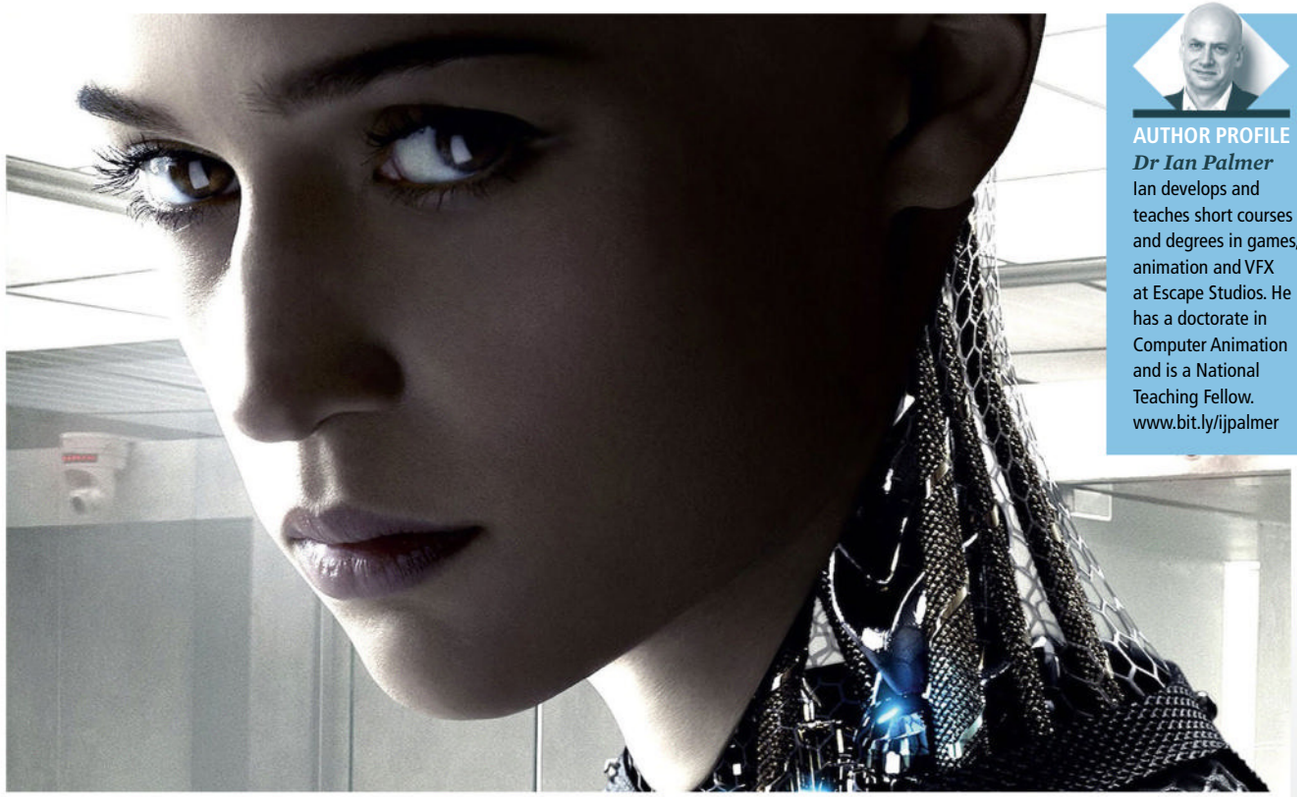
TWELVE SELECT YOUR DATA PASS

Rendering your own data passes is a must. By going into the VRaySamplerInfo node you can then access a drop-down menu to select what data pass you want to have it kick out. In the VRayRenderElement node you can give it a channel to hold the information.

VFX INSIGHT

More human than human?

Dr Ian Palmer considers how technology is helping film robots become more human



THE VFX FESTIVAL

Sign up for the VFX Festival

The VFX Festival, created by Escape Studios, part of Pearson College London, will run from 23-25 February 2016 at London's O2. It will bring the best in VFX, games, animation and motion graphics to industry professionals and anyone considering a career in visual effects. Find out more: www.thevfxfestival.com

brought to you by THE V FESTIVAL X 2016 ESCAPE STUDIOS

AUTHOR PROFILE
Dr Ian Palmer
Ian develops and teaches short courses and degrees in games, animation and VFX at Escape Studios. He has a doctorate in Computer Animation and is a National Teaching Fellow. www.bit.ly/ijpalmer

Robots have been a mainstay of films ever since Maschinenmensch in 1927's Metropolis. This was the start of robots that resembled humans in film.

Since then, from GORT to Johnny Five, robots were created with inspired use of costumed actors, makeup, animatronics and puppets. Then came the liquid metal T-1000, a robot that could morph into your worst nightmare, driving forward fluid simulation and rendering. The fact that in its raw form it was as reflective as polished chrome just makes it all the more impressive. This signalled a shift in robot making, in a quest to make them even more realistic and suspend the disbelief of the viewer.

> Ava in Ex Machina showed how CG could construct a creature that made you ask questions

Unreal gets real

The rise in CG and its uses has given birth to more believable mechanicals. Last year, we met Ava in Ex Machina, which again showed how CG could construct a creature that made you ask questions: "Where did the robot start and the human end?" or "Where did the CG begin and the human end?"

Likewise, Chappie threw audiences again as the animation ran counter to the design; built for combat, Chappie moves and behaves accordingly but once reprogrammed he adopts a child-like innocence we immediately empathised with.

Over the years, artists in the industry have used all the available tools to create human-like robots, but also ensured that they retained elements of their robotic traits. The processes and technology that have been developed have obviously contributed to the increased possibilities of creating robots that look even more human, but the best animators and VFX artists also know when to draw the line and where to emphasise the mechanical elements, as to not completely overshadow what we hold dear in the first place.

Technology now enables us to create a fully functioning CG C3PO that wouldn't reflect the crew on its metallic surface, but would we really change anything else? I'd say not. VFX is all about making what we see believable, rather than simply making something seem more human.

FYI *For more on VFX visit the VFX Festival: www.thevfxfestival.com*



AUTHOR PROFILE
Marta Niemczynska
Marta is a 3D designer at Corporation Pop in Manchester. For many years she produced work for animations and commercials and is now focusing on game engines.
corporationpop.co.uk

PROJECT INSIGHT

Building a 3D virtual studio in Unity

Marta Niemczynska explains the process for recreating her design studio as a 3D virtual environment in Unity 5



We've been using Unity for more than five years, so when Unity 5 launched we wanted to test its new features, particularly the physically-based shader and realtime GI (global illumination).

PBR (physically based rendering) texturing is not a new concept, but we hadn't had the chance to use it in the Unity engine without using third party assets. We decided to recreate Corporation Pop's studio as closely as possible in Unity 5. Here I share our insight from the project, in which we create an online 3D virtual environment.

> We had to understand how the geometry of the building works, which involved taking lots of reference pictures

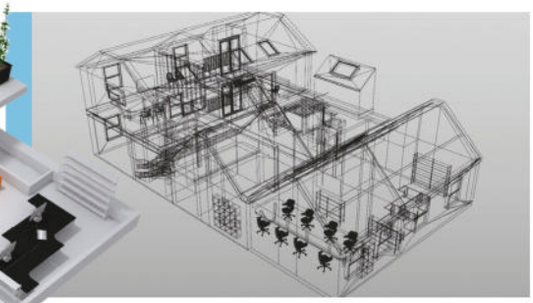
We started by making detailed plans of the studio using MagicPlan, so these could be transformed into 3D walls. It creates vector plans that can then be imported into Cinema 4D and extruded into walls. Unfortunately we couldn't use

USING UNITY 5

PROCESS: HOW THEY DID IT

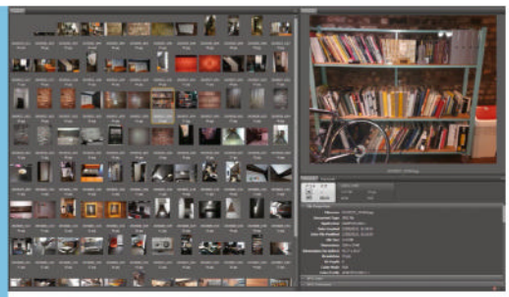
Recreating a real place for VR





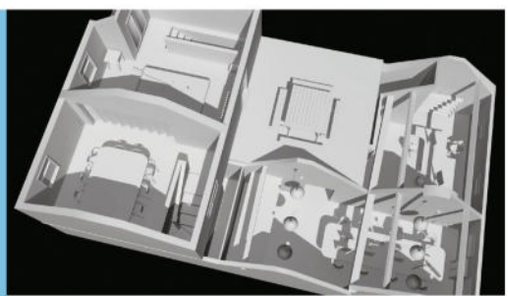
ONE STUDY THE FLOOR PLANS

It's vital to have detailed floor plans. Our plans were very basic, so we recreated them using mobile app MagicPlan, which lets you draw plans by using a phone camera. You walk around your building and place corner points. After calibrating, the app automatically measures the distances between the points and creates vector plans which can be imported into Cinema 4D, extruded into walls and adjusted.



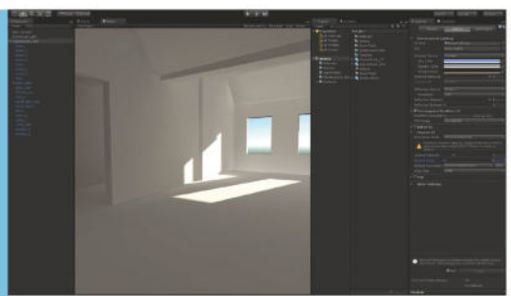
TWO PLANNING AND GATHERING REFERENCES

What platform is this project for? How is it going to be used? Could the assets be used in another project? What tools can I use? What are the challenges? By asking these questions it will help to solve possible problems before they occur. Start gathering reference material to make life easier. We took photos of every corner of the studio, recorded films and made early decisions on the props we would be making.



THREE MODELLING THE BUILDING

Once you have walls and a roof, add space for windows, doors, support beams and flooring. Plan how to divide it into manageable sections and how textures will work. After considering a modular approach – common in game design – we opted for a full extruded version split into floors with detached roofs, floors and staircases, as it would have multiple uses, including AR in an isometric view.



FOUR FIRST LIGHTING TESTS IN UNITY

We chose precomputed Realtime GI to try Day/Night lighting, which you can't achieve with baked GI. There were issues with light leaks where the roof touches the walls, but keeping full walls instead of planes, adjusting lightmap settings and cranking up the lightmap resolution solved most of them. Use your own lightmaps instead of Unity-generated versions. Baked GI appears more stable and returns less artifacts.

There is nothing more satisfying than having a stroll through a virtual environment you have created... I can't see an end to the testing and retesting of every element

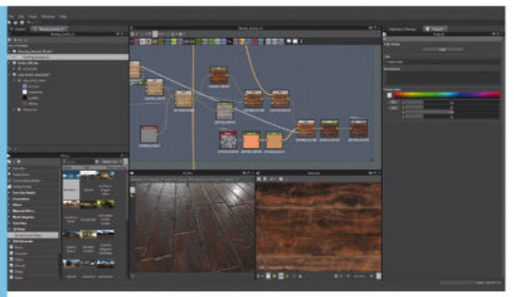
the app to draw the ceilings and roofs, so this was achieved by examining the building and figuring out the shapes.

To create windows, doors, staircases and the roof, we had to understand how the geometry of the building works, which involved taking lots of reference pictures. This raised some interesting features. I'd never realised that the supporting beams I see above my head everyday are different sizes and extend through to another room, reflecting the shape of the roof. As you move through the build you notice more of this type of detail, which raises more questions. It's vital to fully appreciate these elements of the design and build to ensure realism.

Complex texturing

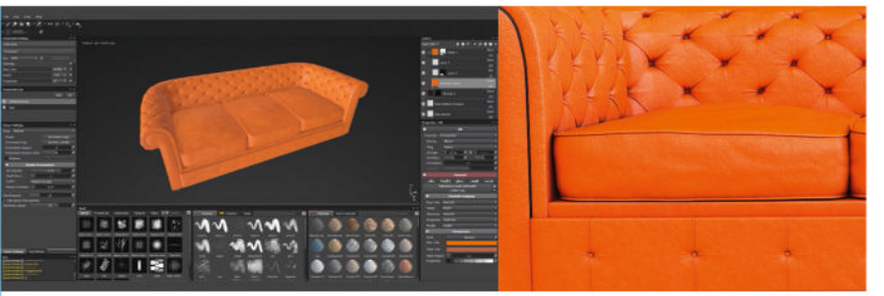
Textures are probably the most important part in game engine based environments. Limited by the amount of polygons we can use, we can't use geometry to create detail, so only good texturing can fool the eye and create detail where there is none.

Our build was for desktops, however the simplified assets would also be used for an AR (augmented reality) version of the studio and VR (virtual reality) could be considered at a later stage. Therefore, by asking these questions early on we realised that while geometry should be fine across all of those versions, texturing would have to be adjusted for each medium.



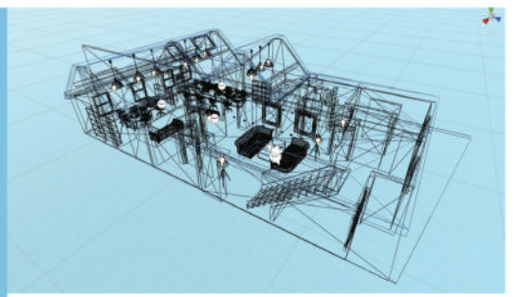
FIVE TEXTURING

Use tiled textures for large areas. We prepared brick, wooden floor, stucco textures and roof slates in Substance Designer, which makes creating complex textures easy and allows control of each of the channels. Cinema 4D and Unity have full support for Substances. We used Cinema 4D to UV the building and assigned materials to respective parts. Once imported to Unity we replaced those materials with Substances and adjusted tiling.



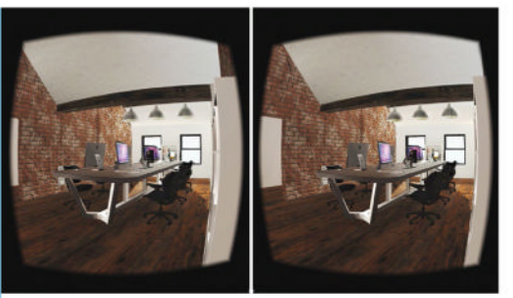
SIX CREATING THE PROPS

With a lot of props to create, focus on the major elements. Our Chesterfield couches were complex, so we created a high and low poly model in Cinema 4D with materials assigned to low poly versions for separate elements. We brought both into Substance Painter, baked maps onto a low poly model and textured. Some props like phones were fully textured in Cinema 4D, others use basic materials or substances.



SEVEN LIGHTING AND EFFECTS

Multiple light set-ups and testing are required for a realistic effect. For areas with little natural light, we used point lights and LED ceiling lights with emissive materials. Night lighting consists of multiple spot and point lights at the light sources. Unity's sample project 'The Courtyard' offers insight to controlling the time of day cycle. Avoid too many image effects as they can impact on performance. We used antialiasing, bloom, vignette and colour correction scripts.



EIGHT THINKING VR

Seeing a scene in the first person perspective while fully immersed, creates new challenges and requires a different approach to the way we create virtual worlds. Realism, PBR texturing, post effects and a frame rate of 75 or more are challenging with no simple solution. We've made simple test builds for our studio, such as scale, lighting, texturing and colour intensity, and all impact how you feel in the environment.

WHO ARE CORPORATION POP?

The agency combining creativity and technological innovation

Corporation Pop is a digital design agency based in Manchester, which was established in 1991. The team creates strategic, thoughtful and innovative design and technology solutions to help organisations communicate with their audiences. They achieve this by gaining a deep understanding of their needs and those of their customers. Corporation Pop works with companies like Channel 4, the BBC, EMI, the NHS and Live Nation to deliver exciting and often ground-breaking projects across a range of media and devices – from websites, games and mobile applications to virtual environments and enterprise software.
www.corporationpop.co.uk

Substance Designer and Painter allowed fast creation of complex texturing that would work well across various game engines. Allegorithmic's Substance Designer was used for the brick walls and wooden floor as it was vital that they were realistic, detailed and seamless.

Moving to Unity

You can't comprehend how many objects are in a room until you have to model them. We focused on recreating the most important props. Some of them, like a tripod lamp, were fairly simple to make and texture since they consisted of primitive shapes. Others, like orange chesterfield sofas, took longer as they were vital to the final look and required much more detail.

We created a high poly version of one sofa and used it to bake a detailed normal map, which would then be used on a low poly version. We textured the sofa in Substance Painter. It has a layer system, which helped deal with the complex surface.

All of the texture channels were easily exported for use in Unity. After many tweaks to the materials, multiple light setups and a very long and frustrating journey of finding the right lightmapping settings, the result is a realistic series of props that bring to life our 3D virtual studio.

There is nothing more satisfying than having a stroll through a virtual environment you have created. But as this is such a personal project, I can't see an end to the testing and retesting of every element. I feel that this will be a continually evolving project.

FYI *For all the assets you need go to* ***creativebloq.com/vault/3dw205***

SOFTWARE REVIEW

Poser Pro 11

PRICE Poser $199 Poser Pro $499 | COMPANY Smith Micro | WEBSITE my.smithmicro.com/poser-3d-animation-software.html





AUTHOR PROFILE
Cirstyn Bech-Yagher
Cirstyn is a freelance CG artist and educator, with over 15 years' experience in 3D. Her clients have ranged from AMD to Daz 3D and Future Plc. She is currently providing design and tutorial content to HobbyRenderer.com's launch in February.
nothern-studios.com

Poser 11 comes with many new features and tweaks, including Smooth Translation of Joints, adaptive rigging, area lights, volumetric materials and caustics, subdivision morph targets, metrics and an FBX exporter. Of course, the standout feature from this release is the new PBR renderer, SuperFly.

Based on a forked version of Blender's Cycles, it brings Poser's rendered output on par with Reality, the Lux-based PBR plug-in for Poser, and Daz Studio's iRay.

Alas, the SuperFly implementation could have benefited from a little less reverence and a little more functionality. This is because Smith Micro – makers of all things Poser – are very loyal to Poser's original, iconic, late 90s MetaCreations interface and workflow. This could be the reason why the Advanced Material Room has not been modified much to facilitate Cycle's many nodes with features commonly found in a node-based environment, like grouping, zooming, and tidying functionality. Instead, you navigate via a horizontal and vertical slider, no matter how many nodes you have in the room.

> The standout feature from this release is the new PBR renderer, SuperFly

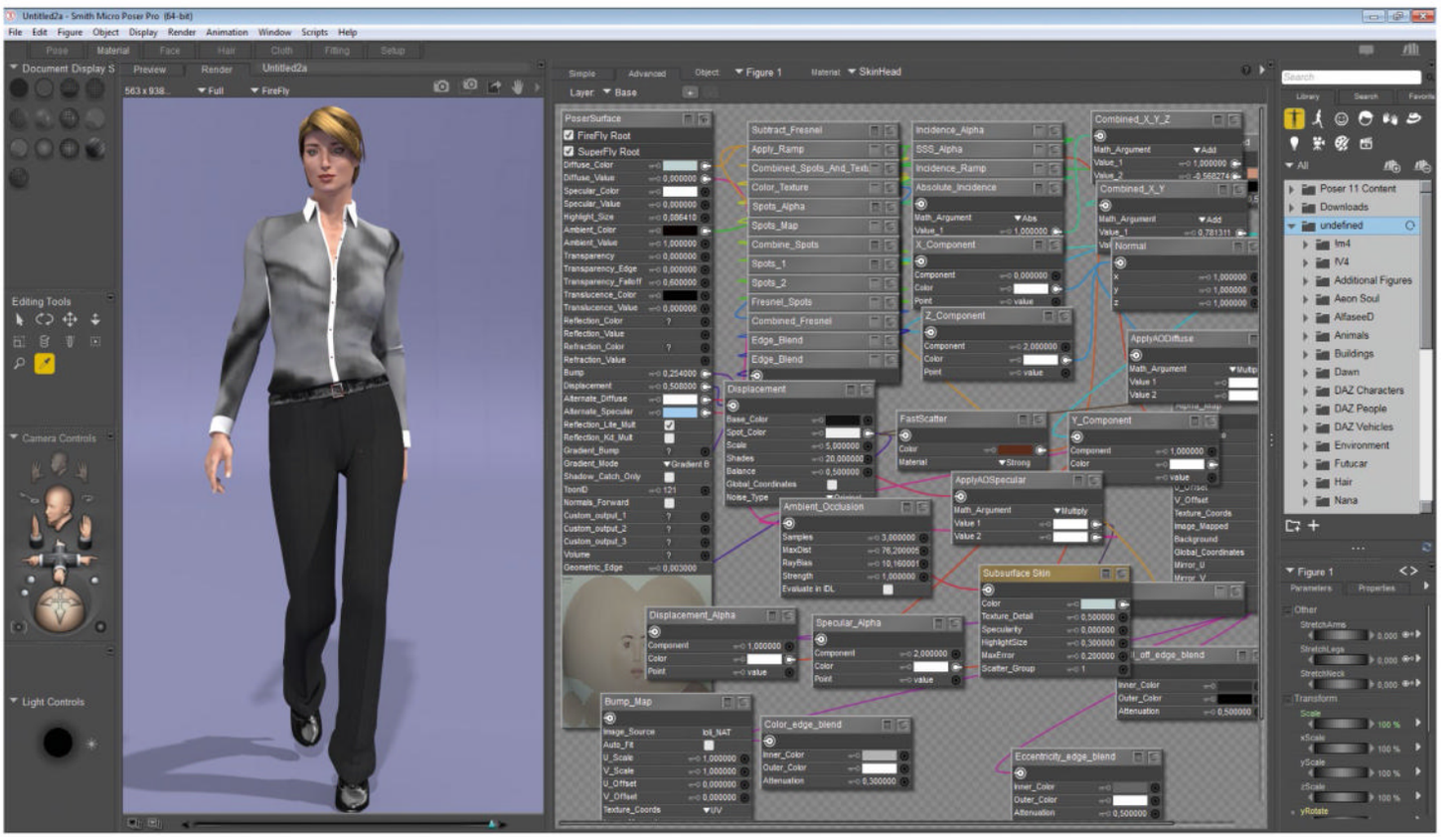
In addition, the renderer is not as fast as iRay and Reality, and its settings can be confusing, especially for many of the ready-to-render novices Poser caters to. Even though render speed will always depend on CPU, GPU, the amount of content in your scene, and its various shaders, a CPU SuperFly render of a glass, wine, five lights and a backdrop should not take over 12 hours to render on super high settings with caustics. One issue could be that once you select CPU or GPU, and then select a preset, your selected hardware will jump back to your CPU. If you're not aware of this, you can get into some very long render times indeed.

Poor user guidance

As for the quality of the output, once you get familiar with the new renderer and its workflow it is actually a relief to be able to do good metal, volumetric and caustic renders in Poser without having to use Reality or Octane. However, Smith Micro have not been good at documenting how to go about this, unlike freeware Daz Studio, who added shaders, SuperFly's slow, or random rendering speed, and other issues, detract from what could have been a great release

ONE OF THE OLDEST 3D APPLICATIONS AROUND

Created by Kai Krause's iconic MetaCreations in the 90s, Poser has, over the years, been a consistent gateway drug into 3D for many, as its ready-to-render content and easy interface has taught many beginners the X, Y and Z of 3D.



MAIN FEATURES

New, Blender Cycles-based renderer, SuperFly

Actor Selection History

Smooth Translation of Joints

Can create handles for ghost bones

Measurement and Text Props

lights and ready-to-render scenes to analyse for users new to iRay. Instead, you get outdated links to poser.com and two chapters in the manual explaining the dialog and the nodes, in addition to some mentions here and there, and the response, "Yes, there is a learning curve" when people ask about SuperFly in the Poser forums. To quote a user in the RDNA forum: "This is like explaining the plus sign, and then expecting users to do complex algebra."

Features with potential

Despite the growing pains of a new renderer, the other new features fare better. For content creators, the new ability to create handles for dresses, cloaks and skirts is a godsend, and Smooth Translation of Joints actually does add more, and better control to figure rigging. Adaptive Rigging for Morph Dependent Joint Centers does ease the tweaking of conforming garments to fit figures morphed from dwarf to orc-size easier.

In addition, you can now create morph targets on subdivision levels and export them. To boot, real world-based Area Lights beef up realism in renders, and Actor Selection History functions, like the Photoshop History brush, are superhandy when you're building your scene and still working out its look and figures. Together with the configurable Autosave they do help ease your workflow, like many of the other features.

So, is it worth picking up? Despite Poser starting to show its age a little, and if you don't mind the learning curve for Cycles and shaders in Poser 11, the other new features are fairly decent for hobbyists, content creators and forensic artists alike.

VERDICT

Poser 11 would've benefited from a little TLC in the Material Room as content converted to SuperFly gets messy, fast

IN PRACTICE: GOOD CONTENT CREATION WITH RENDER IRKS

I first 'met' Poser on a PC World CD. I think it was version three. I've used it on and off over the years, especially when dipping my toes into content brokering. I really liked the thought of Cycles in Poser; it was a good choice, when Lux and iRay were already taken. I wasn't so big on the implementation, though, and the fact that Poser still hogs all your resources – to the extent your system stutters, hangs, or crashes. It was actually less cumbersome for me to render SuperFly via CPU than GPU. I also experienced hangs forcing reboots when using high subdivision levels, which is something I've never experienced in Daz Studio, Max, ZBrush or Mudbox. Hopefully, these are new release issues and will be patched.

SOFTWARE REVIEW

Paint & Stick

HIGHLY COMMENDED 3D WORLD

PRICE $199/£131/€181 for Paint & Stick; $99/£65/€90 for Paint | COMPANY aescripts + aeplugins | WEBSITE www.aescripts.com



AUTHOR PROFILE
Steve Jarratt
Steve has been interested in CG for many years. He's a regular contributor to 3D World and edited the magazine for two years.
bit.lly/steve-jarratt

After four years in development, Paint & Stick has arrived, and mighty impressive it is too. Effectively two plug-ins in one, it enables the creation of hand-drawn animation within After Effects, plus the 'gluing' of 2D elements on to 3D renders.

It features the usual array of painting tools, with the import of Photoshop brushes and creation of custom brushes within After Effects, onion-skinning, plus erase and matte brushes (for erasing strokes or the layer itself). For compositing artists and animators, this in itself is worth the investment, but as this is 3D World we're more interested in the 'Stick' part than the 'Paint' part. With the sticky paint tools, you're able to attach a 2D element to a rendered 3D object and have it conform to the shape as it moves.

First you need to generate an Object ID pass and a Sticky Pass of your 3D project – plug-ins are provided for Cinema 4D and Maya. Fortunately, it's all neatly automated and takes very little time, as it's merely rendering the objects' coordinate mapping. Back in AE, you load your footage, add a new solid layer and apply Paint & Stick. You then load the Object ID and Sticky Pass sequences, and link them to the plug-in so it can identify each object and how it sits in 3D space. It's then a matter of either loading in a premade brush (currently limited to 500x500-pixel PNGs) or capturing one from an image or footage in the timeline, with all of AE's native tools at hand.

You're able to attach a 2D element to a rendered 3D object and have it conform to the shape as it moves

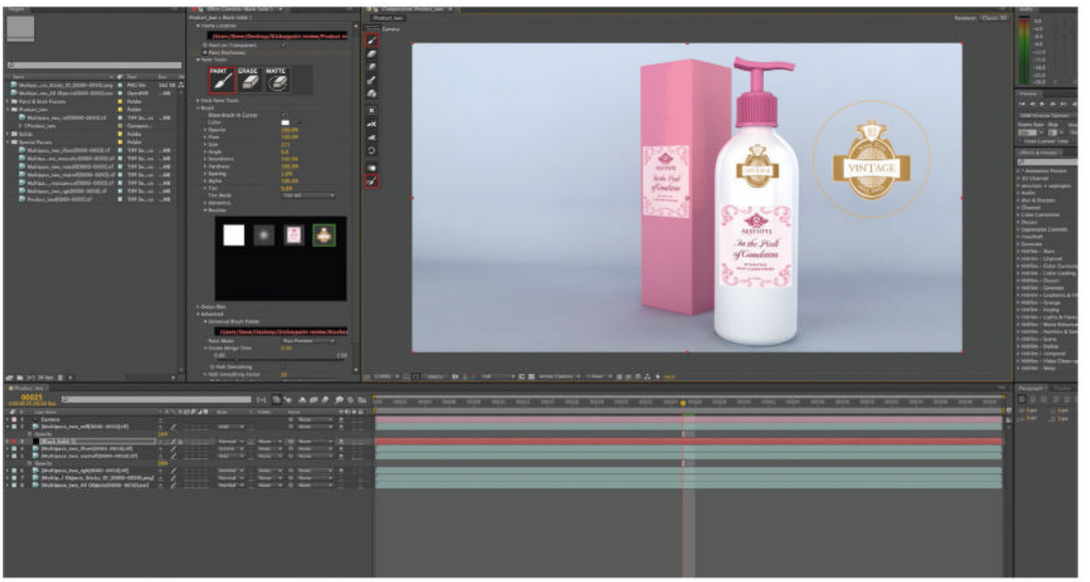
Choose a relevant frame – for example where the subject is neatly face-on – apply the brush and then hit the Glue button. Now like magic, when you scrub through the timeline, the image will adhere to the object, moving in concert and being occluded by itself and other objects. Even on complex scenes the results were excellent and looked no different to a full render. In one example, we output a blank bottle and box and applied labels to them in After Effects. By placing the Stick & Paint layer beneath the reflection and shadow passes, the imagery was tied in perfectly to the scene. But if you suddenly need to change a logo, you simply hit the Delete All Glue button, apply a different image and re-render.

As well as adding logos, decals and other imagery, Paint & Stick is also ideal for last minute revisions, enabling you to correct errant textures or cover up unwanted artefacts without the need to re-render the entire project. It's an ingenious bridge between the worlds of 3D and 2D, and while version 1.0 is easily deserving of a place in your Effects menu, we think future editions, with the ability to 'glue' animated sequences, will be absolute must-haves.

VERDICT

MAIN FEATURES

- Painting/animation toolset right within Adobe After Effects
- Includes erase functions and onion skinning
- Enables the capture of brushes in the AE project window
- Paint 2D elements on to 3D renders
- Automated 'Sticky Pass' plug-ins for C4D and Maya



With Stick & Paint imagery added beneath shadow and reflection passes, the result looks no different than if it had been fully rendered

PAINTING IN 3D

Formerly known as 'Stickey Paint', the plug-in was conceived by TD and 3D generalist Chris Vranos in 2011, and first publicly shown in April 2014. The next step is to port it to other compositors and introduce the ability to glue animated sequences, as well as paint reflections and highlights..

SOFTWARE REVIEW

Redshift

PRICE $500 | COMPANY Redshift Rendering Technologies, Inc. | WEBSITE www.redshift3d.com

MAIN FEATURES

GPU accelerated render engine

Full biased engine, which allows for greater flexibility

Vastly increased render speed compared to CPU based render engines

One license comes with free plug-ins for Maya, and Softimage applications

GPU rendering has revolutionised the CGI industry over the past couple of years. Redshift has become one of the most talked about GPU render solutions as it offers the flexibility of existing CPU based render solutions, with the speed of GPU acceleration.

The key to Redshift is that it's a biased render engine, meaning it uses techniques to 'cheat' how the image works – exactly the same methodology traditional CPU based render engines such as V-Ray use. Unbiased engines mimic the physics of light much more closely, meaning comparably much longer render times and potentially less creative options. Until now, most popular GPU render engines have been unbiased, giving an exponential render time increase. The Redshift team have brought the grunt of the GPU to biased rendering, and it makes Redshift potentially one of the fastest and full-feature render engines on the market.

Speed means nothing if the usability doesn't match up. Luckily, this isn't the case; we tested Redshift with Autodesk Maya 2016 (it is also available for 3ds Max, and Softimage with C4D and Houdini coming) and found it integrated well with the host application. Dedicated Redshift shader options, camera and render settings were all in logical places. Redshift supports Render proxies well and a full set of AOVs (render pass outputs) are available.

> If you're used to working with other biased engines, Redshift is simple to get your head around

With IPR, Redshift allows either bucket or progressive rendering, which constantly updates allowing really quick iteration during look dev.

With great tutorials on Redshift's site, if you're used to working with other biased engines, Redshift is simple to get your head around and easier than most to use. Basic controls are well organised within Maya's render settings, or logically placed within an object's settings.

Redshift uses out-of-core architecture, which uses all the resources of the computer to render scenes – unlike many GPU render solutions which can only use the memory available on the GPU, meaning that no compromises for scenes are required. Redshift also uses all the memory on all the GPUs within a PC, even if they have different RAM amounts.

Animation and camera effects, such as depth of field, are available and work beautifully, which when the samples are increased, create a lovely rolling falloff, especially when used with the Redshift shaders.

Redshift scales well for freelancers or studios, as one comparatively cheap license covers one PC, and if that PC happens to have 12 GPUs in it the license cost is the same as if it had one, making it potentially more attractive from a speed and cost point of view than a CPU based render solution. This is good as Redshift is addictive, and has the potential to become a dominant render platform for the rest of the decade.

VERDICT



Glassworks used the power of Redshift to render the Singing Babies commercial for Cadbury. Image courtesy of Glassworks

A NEW TAKE ON TRADITIONAL RENDERING

Launched in 2014, Redshift is the first render engine to mix the flexibility of biased render engines with the power of GPU rendering. It has been used extensively in production since its launch, and in 2016 will be releasing more plug-ins for Cinema 4D and Houdini.



AUTHOR PROFILE
Mike Griggs
Polishing pixels since 1995, Mike is a UK based freelance 3D, VFX and mograph artist, as well as a freelance technical writer.
creativebloke.com

INSPIRING CG ARTISTS

3D WORLD

CATCH UP TODAY!

Visit Google Play, Apple Newsstand and Zinio stores to download a 3D World back issue to your tablet or computer.



Back issues

Missing an issue of 3D World?

Fill the gaps in your collection today!

Issue 204 February 2016
Star Wars: The Force Awakens

- Behind the scenes: ILM discuss the making of The Force Awakens
- Master the workflow for modelling ZBrush droids
- Create a photoreal character render of Boba Fett
- Discover the untold story behind the making of A New Hope
- **Downloads** Free models, videos, material textures, setup files & more!









Issue 203 January 2016
The 2016 VR revolution

- Improve your real time CG: The game artist's guide to VR
- Discover Epic's 10 ways to improve your Unreal Engine VR movies
- Render a photoreal VR scene from V-Ray to Samsung headset
- Master high-poly creature design
- **Downloads** Free software worth $199, models, videos, setup files!

Issue 202 Christmas 2015
Anatomy sculpting

- 10 techniques to perfect Anatomy. Plus get this cover's ZBrush model!
- Weta creature modelling masterclass
- Model the Joker: create dynamic ZBrush illustrations
- Hone your post-production skills for perfect lighting
- **Downloads** Free Creative Market models, video training, setup files!

Issue 201 December 2015
Game art techniques

- Art of Halo 5 Guardians
- Master character design with Insomniac Games' pro advice
- Create and texture a robotic character with Substance Designer
- Concept and design a real-time game character
- **Downloads** Free iClone 5, video training, setup files, ZBrush models and more!

Issue 200 November 2015
The 200 greatest VFX films

- Sculpt a T-800 Arnie in ZBrush
- Model a cinematic alien creature in ZBrush and 3ds Max
- Create organic armour in Maya
- Discover the 200 greatest VFX films in our reader poll
- How to make a printable costume
- **Downloads** Free Maya eBook, Digital-Tutors courses, models and more!

Google Play www.bit.ly/tdw_google

Apple Newsstand www.bit.ly/3dworld-app



Issue 199 October 2015
The rise of TV VFX

- Create our cover figure: Artifex Studios explain their process
- Master matte painting to recreate a Star Wars Episode VII scene
- The rise of TV VFX: Discover how TV's VFX shows are created
- Recreate an epic Game of Thrones battle scene in 3ds Max
- **Downloads** Video tutorials, textures, models and setup files!



Issue 198 September 2015
ZBrush robots

- Master hard surface modelling in ZBrush
- 25 essential Cinema 4D techniques
- The VFX of Jurassic World
- How to model 3D print-ready collectable figurines
- Graphics card review group test
- **Downloads** ZBrush model, video tutorials, Substances and more!



Issue 197 August 2015
Video games art special

- Professional games artists share their work and insights
- Model a mecha character for video games
- Create perfect run animation cycles for games
- Master Unreal Engine 4, includes video tutorial, models and textures
- **Downloads** iClone 5 worth £69, video tutorials and project files



Issue 196 July 2015
VFX special

- 40 years of ILM, plus discover the /VFX of Avengers: Age of Ultron
- Model Star Wars inspired spaceships
- Master the new modelling tools of Maya 2016
- Create an epic sci-fi environment in Modo
- **Downloads** Video tutorials, project files, resources and more!



Issue 195 June 2015
Photoreal portraits

- Create a lifelike portrait with effective modelling & rendering
- Sculpt armour in ZBrush
- Meet Chappie: how Image Engine brought the robot to life
- Industry experts advice for kickstarting your career in CG
- **Downloads** Free book, video tutorials, project files, resources and more!



Issue 194 May 2015
Make a Star Wars movie

- Create your own VFX movie
- Master mech modelling in Cinema 4D and ZBrush
- Star Trek interview: Pierre Drolet talks building starships
- The ultimate guide to lighting and rendering a complex illustration in LightWave
- **Downloads** Video tutorials, project files, resources and more



Issue 193 April 2015
ZBrush anime skills

- Master the art of modelling an anime style character
- ZBrush 4R7: why the latest release is an essential upgrade
- Create a collectible action figure
- 10 years of CG in anime: meet the directors who are creating the leading 3DCG
- **Downloads** Video tutorials, project files, resources and more



Issue 192 March 2015
Model magical ZBrush creatures

- Create our cover character. Complete tutorial with video and model!
- The ultimate guide to mastering Maxwell Render
- Big Hero 6: discover Disney's latest software
- Matte painting for video games
- **Downloads** Video tutorials, project files, resources and more

Zinio www.bit.ly/tdw-zinio

MY INSPIRATION

Dave Morley

Image Engine's VFX supervisor reveals how a VHS demo of Luxo Jr got him into the industry





ARTIST PROFILE
Dave Morley
Dave has been involved in CG and VFX for over 20 years, and his CV includes Australia, Captain America: The First Avenger and Unbroken. In 2014 he was nominated for a VES Award.
bit.ly/205-dave-morley

I wanted to get into the VFX industry because of my love of movies, computers and photography. But the initial catalyst? Many years ago I was working in a photographic studio printing 35mm film slides for things like PowerPoint presentations. I worked with a huge variety of software packages, as people sent files to us in all different formats.

One day a box arrived with some new software from a company I'd never heard of: Pixar. The software was called Typestry, and it was a small program that could be used to create 3D type. Along with the software was a VHS tape marked 'Luxo Jr'. I was curious. I took it home, put it in the machine and bam! – I was hit by a sledgehammer. I was gone, hook line and sinker, and without knowing it at the time, my journey had begun.

We had a copy of 3d Studio, so I started modelling and lighting. Admittedly they were really terrible at the time, being as I was teaching myself, but I kept at it. A good friend of mine was a producer at a local VFX/design house in Sydney called Garner MacLennan Design. As it happened, they were looking for a junior 3D artist to join their team. Fortunately, they didn't require formal training as it simply didn't exist at the time! I got the job and haven't looked back since!

If I had to share just one 'wow' moment, it would have to be working with Frank Miller. I had worked indirectly with Frank on his film adaptation of The Spirit. Through that, I had the opportunity to work with him again on a Gucci commercial.

I flew to Rome from Australia for the filming, and after a good 20 hours of travel I was whisked off to a room in the studio, and it was there that I met Frank in person for the first time. He started to draw storyboards to explain some of his thoughts – I was jet lagged and very tired, so it was a totally surreal moment. He was a hero of mine of sorts, and I'd loved his work for a long time prior to working with him. So, sitting there watching Frank Miller put pencil to paper was a really significant moment for me.

> I took it home, put it in the machine and bam! – I was hit by a sledgehammer

Pixar's Luxo Jr was the catalyst for Dave Morley's VFX career

FYI *See more of Dave's work at www.image-engine.com*



NVIDIA® QUADRO® ACCELERATE YOUR CREATIVITY.

Accelerate your creativity with NVIDIA® Quadro®— the world's most powerful workstation graphics.

Whether you're developing revolutionary products or telling spectacularly vivid visual stories, Quadro gives you the performance to do it brilliantly.

NVIDIA Quadro K6000 VCQK6000-PB	
NVIDIA Quadro K5200 VCQK5200-PB	
NVIDIA Quadro K5000 MAC VCQK5000MAC-PB	
NVIDIA Quadro K4200 VCQK4200-PB	

NVIDIA Quadro K2200 VCQK2200-PB	
NVIDIA Quadro K2000DVI VCQK2000DVI-PB	
NVIDIA Quadro K620 VCQK620-PB	
NVIDIA Quadro K420 VCQK420-PB	

Learn more **www.pny.eu/quadro** & **pny.quadrok-selector.com**

Insight
uk.insight.com
Tel: 0844 846 3333

Misco
www.misco.co.uk
Tel: 0800 038 8880

Dabs.com
www.dabs.com
Tel: 0870 429 3825

Scan Computers
www.scan.co.uk
Tel: 0871 472 4747

PNY® Professional Solutions

NVIDIA Quadro® / Tesla® / GRID™ / Prevail SSD

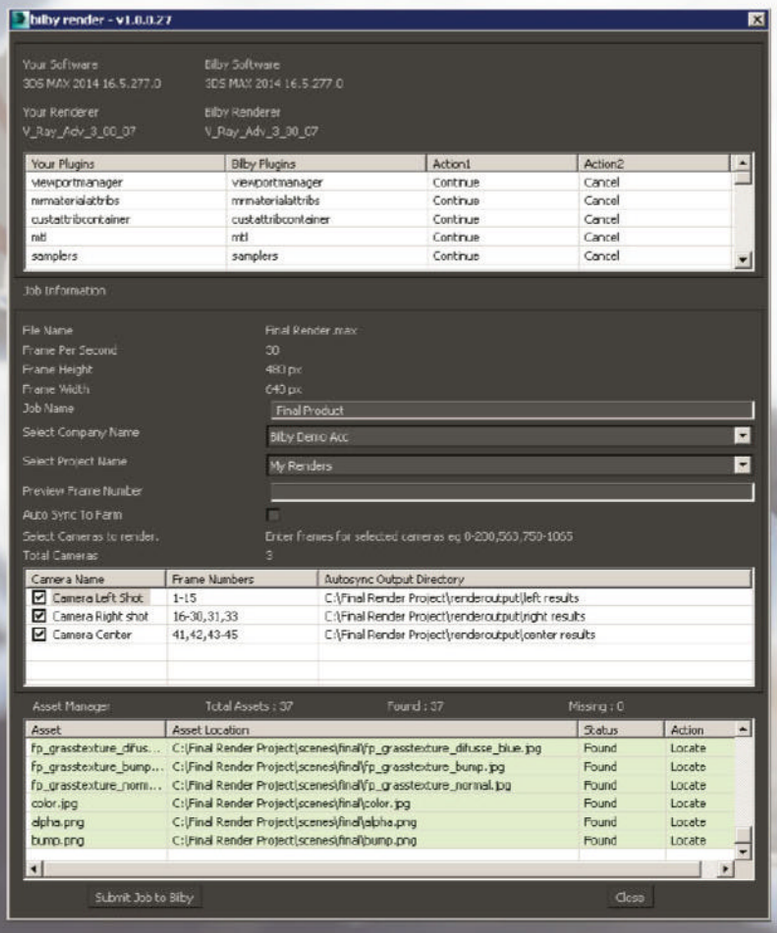
NVIDIA.

© 2014 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, and Quadro are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks or registered trademarks of the respective owners with which they are associated.

bilby.com™

Upload Once - Render ALL Your Cameras

Enter frame ranges for each of the cameras you want to render, then just upload the scene once.



Render Farm + Collaboration

Do more with your render results using our free collaboration tools.

Teams - Clients - Reviews - Surveys - Planner - Calendar - Projects - Tasks - Full Featured FREE Account Available.

Render Now

- 8052 GHz - 3552 Intel Xeon Cores.
- Plus FREE Hyper Threads to Double that Rendering Power.
- Fully AUTOMATED Render Farm.
- Seamlessly INTEGRATED into your 3D Pipeline.
- FREE to use Collaboration Tools.
- READY TO RENDER NOW.

FREE $50 RENDERING TRIAL

V-Ray | 3DS Max | Maya | Cinema 4D | Blender | bilby.com

© RONNIE OLSTHOORN / WWW.AVIATIONART.ARTSTATION.COM